A MONOGRAPH OF THE PHEASANTS

BY

WILLIAM BEEBE

VOLUME I.

A MONOGRAPH OF THE PHEASANTS

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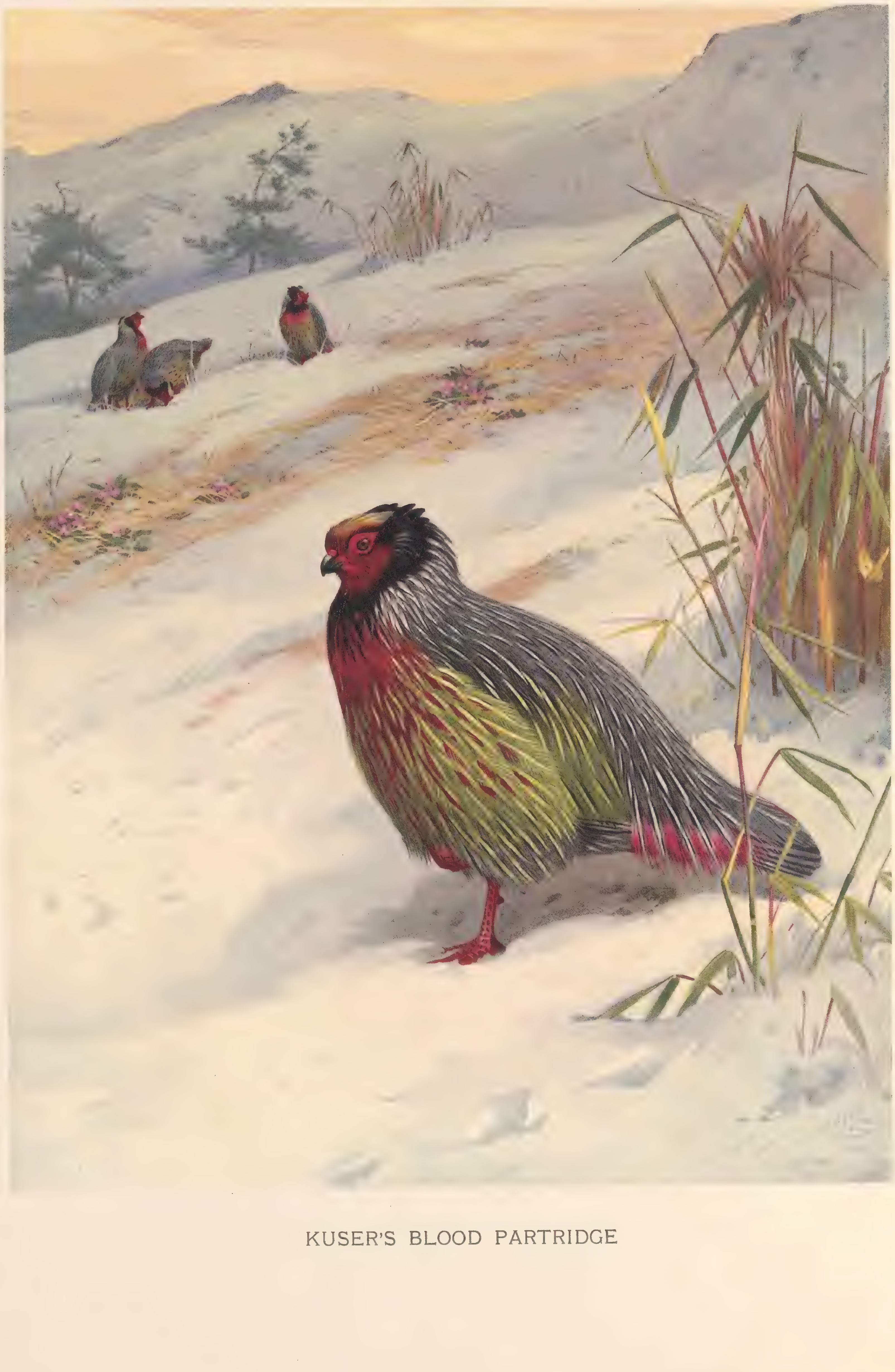

KUSER'S BLOOD PARTRIDGE

FRONTISPIECE, PLATE I

KUSER'S BLOOD PARTRIDGE

Ithagenes kuseri Beebe

In the late afternoon, a small flock was working its way down a mountain slope to some sheltered roosting place at a lower elevation. An unseasonable snowstorm, falling on the tumbled uplands of northern Yunnan, had half covered the Chinese primroses which were blossoming in dense clusters. The dead grass of last year and newly budding dwarf bamboos were visible, and in a hollow some weather-beaten conifers had found a foothold near the upper limit of tree-growth. When darkness fell the Blood Partridges, perched deep in the tangle of a rhododendron thicket, would be safe from foxes and martens.

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BY

WILLIAM BEEBE

Curator of Birds of the New York Zoological Park ; Fellow of the New York Zoological
Society and Director of the Tropical Research Station in British Guiana ; Fellow
of the American Ornithologists' Union and of the New York Academy
of Sciences ; Member of the British Ornithologists' Union ;
Corresponding Member of the Zoological
Society of London, etc.

IN FOUR VOLUMES

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TO

COLONEL AND MRS. ANTHONY R. KUSER

THESE VOLUMES ARE DEDICATED

IN THE SPIRIT OF SINCEREST FRIENDSHIP AND ESTEEM

PREFACE

THE study of the living pheasants in their natural environment in various parts of Eastern Asia—this was the main object of the seventeen months' journey through Asia and the East Indies taken by the author of this monograph. The urgency of this journey sprang from the fact that the members of this most beautiful and remarkable group are rapidly becoming extinct, so that the record of their habits and surroundings, which is important to the understanding of their structure and evolution, will soon be lost for ever.

The literature of the group is already vast; innumerable papers and some monographs have been written, but to no naturalist hitherto has the opportunity been given to study nearly all of these birds in life. This opportunity came to William Beebe through the generosity of Colonel Anthony R. Kuser of Bernardsville, New Jersey, a member of the Board of Managers of the New York Zoological Society, and one of the benefactors of the Zoological Park. Having been interested for many years in developing his large collection of domesticated pheasants, it was he who suggested that a monograph of the entire family of these birds be undertaken, and who offered to support both the exploration and subsequent publication in a most complete manner, so as to produce a work which, from the standpoint of truth, of beauty and of thoroughness, should be worthy of the important place which the pheasants occupy in the science of ornithology.

The expedition was planned with the greatest care by the author and officers of the Society, and the author was given a leave of absence from his duties as Curator of Birds in the Zoological Park for a period of seventeen months (December 26, 1909, to May 26, 1911) for the express purpose of studying the pheasants in the field. Ceylon, India, Burma, China, Japan, the Malay States, Borneo and Java were visited and the pheasants of each country found and studied. Of the nineteen groups of these birds, eighteen were successfully hunted with the camera, with field-glasses, and, when necessary for identification, with the shot-gun. A talented artist, Mr. Bruce Horsfall, accompanied the expedition during part of the journey to paint the various scenes of pheasant environment. The trip, which extended over twenty countries, resulted in a rare abundance of material, both literary—concerning the life histories of birds—and pictorial, photographs and sketches. During the summer which followed the expedition (1912) the time of the author was spent in studying the great type collections in the Museums of London, of Tring, of Paris and of Berlin.

Thus nearly one hundred species are included and systematically described. The full-grown male and female characters, the changes of plumage from chick to adult, the songs, courtships, battles, nests and eggs, and the general life history and relation to the surroundings, both human and animal, form the chief subject matter.

b

The birds are illustrated in nearly one hundred coloured plates by six of the leading American and English artists. The haunts of the pheasants are shown in an equally large number of photogravures, reproduced from the author's photographs, ranging in scene from the slopes of the Himalayan snow peaks, sixteen thousand feet above the sea, to the tropical sea-shores of Java. In addition to these are found numerous maps showing the distribution of the birds, diagrams of feathers, and numerous other illustrations. The elaborate history of the Red Junglefowl, the ancestor of our domesticated poultry, is unique, and the story of the part that this fowl has played in human history is a phase of the subject which has not before been presented. For the naturalist-sportsman, stories and detailed directions for the shooting of the pheasants in their native lands have been collated, while legends and native superstitions round out the account of the relation of these birds to mankind. For the reader interested in keeping and breeding these beautiful birds, there is included a *résumé* of the best methods in use, both on large preserves and estates, as well as in the many small aviaries, which are now found both in England and America.

Never, perhaps, in the history of the birds of the earth will it be possible to produce another work of quite such scope; for not a month passes but the rarer birds of all kinds are being pushed back further into the jungle and into the mountains, where before long they will make their last stand. Hence the monograph presents a very strong sentimental appeal to all bird lovers.

This monograph, which represents eight years of preparation, is by far the most important scientific work as yet undertaken by the New York Zoological Society. That the author has fulfilled his part, both in exploration and in subsequent scientific research and in popular as well as detailed description, will be witnessed on every page of these four volumes, which, we trust, may ever endure as a monument to the labours of the author and to the generosity of the benefactor.

HENRY FAIRFIELD OSBORN,
President of the New York Zoological Society.

New York City.

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LIST OF COLOURED PLATES, PHOTOGRAVURES AND MAPS

COLOURED PLATES

PLATE I. KUSER'S BLOOD PARTRIDGE (*Ithagenes kuseri* Beebe) . . *Frontispiece*

Painted by A. Thorburn, after G. E. Lodge.

In the late afternoon, a small flock was working its way down a mountain slope to some sheltered roosting place at a lower elevation. An unseasonable snowstorm, falling on the tumbled uplands of northern Yunnan, had half covered the Chinese primroses which were blossoming in dense clusters. The dead grass of last year and newly budding dwarf bamboos were visible, and in a hollow some weatherbeaten conifers had found a foothold near the upper limit of tree-growth. When darkness fell the Blood Partridges, perched deep in the tangle of a rhododendron thicket, would be safe from foxes and martens.

PLATE II. EGGS OF BLOOD PARTRIDGES, TRAGOPANS, IMPEYANS AND EARED-PHEASANTS . . . . *Facing page* xliv

Drawn by H. Grönvold.

1. Two eggs of Geoffroy's Blood Partridge (*Ithagenes geoffroyi*), Tachienlu, Western China, collected by Mr. Pratt.
2. Egg of Kuser's Blood Partridge (*Ithagenes kuseri*).
3. Two eggs of Satyr Tragopan (*Tragopan satyra*), laid in captivity.
4. Two eggs of Cabot's Tragopan (*Tragopan caboti*). The left-hand one collected in Kuatun, China, May 17, 1878, by J. D. D. la Touche; the right-hand one laid in captivity in Yorkshire, England.
5. Egg of Western Tragopan (*Tragopan melanocephalus*), laid in captivity.
6. Egg of Blyth's Tragopan (*Tragopan blythi blythi*), laid in Assam in captivity, by a bird from the North Cachar Hills.
7. Two eggs of Temminck's Tragopan (*Tragopan temmincki*), from "China."
8. Egg of Brown Eared-Pheasant (*Crossoptilon mantchuricum*), laid in captivity in the Zoological Gardens, London.
9. Three eggs of Impeyan Pheasant (*Lophophorus impeyanus*), all from northern India; the centre one collected at Lookel, June 1, 1874.
10. Egg of White Eared-Pheasant (*Crossoptilon tibetanum*), collected by Mr. Pratt, near Tachienlu, May 1890.
11. Egg of Blue Eared-Pheasant (*Crossoptilon auritum*), laid in captivity.

All from the British Museum Collection, except Nos. 2, 5 and 6, which are from that of Mr. Stuart-Baker.

PLATE III. SIKHIM HIMALAYAN BLOOD PARTRIDGE (*Ithagenes cruentus affinis* Beebe) . . . . *Facing page* 6

Painted by G. E. Lodge.

Blood Partridges keep close to the edge of the melting snow, gradually ascending in the spring and summer. But in the high altitudes of the Sikhim mountains, late spring storms often cover every growing plant deep in snow. To obtain food the Blood Partridges are obliged at once to retreat far down the valleys to where the warmth has turned the snow to rain. Occasionally the birds are able to remain storm-bound and yet find food. This occurs when the insects, caught suddenly unawares, retreat in numbers to pass a few days benumbed with the cold in the seed cases of last year's lilies. Some of these are empty, others partly filled with seeds, and here earwigs, beetles, moths and spiders find a temporary haven. And this haven at least one flock of Blood Partridges discovered and ruthlessly rifled, spilling insects and seeds upon the snow and feeding to its heart's content.

Plate IV. PLUMAGES OF THE HIMALAYAN BLOOD PARTRIDGE (*Ithagenes cruentus* Hardwicke) . . . . *Facing page* 16

Drawn by H. Grönvold.

The Blood Partridge acquires its adult plumage during the first year of its life. If a chick slips from its shell in May, it will be hardly distinguishable from its parents in October. Except for a lack of spurs it is as well equipped for the dangers of life as its father.

Figure 1 shows the chick in its down about a week old. The little wings are just visible, but the legs are the most prominent feature. The head and neck are grey and black, and the body is of a warm rufus.

Five weeks later the down has been shed and the young bird is in full juvenile garb of dull mottled buff and black, with terminal spots of pale buff. The legs have increased but little, but the wings and tail show that the bird roosts high and can escape swiftly from any enemy. Figure 2 shows a juvenile bird of six weeks.

In Figure 3 a young cock of two months is well advanced in the adult plumage. Most of the juvenile brown has left his back and tail, and the green and scarlet feathers are rapidly covering the breast. The two outer juvenile tail feathers and the white-shafted outer primaries are still unshed.

Plate V. GEOFFROY'S BLOOD PARTRIDGE (*Ithagenes geoffroyi* Verreaux) *Facing page* 30

Painted by G. E. Lodge.

Still dominated by the majesty of Kinchinjunga, although from a wholly new angle, we find this species of Blood Partridge among the snowy uplands of eastern Tibet. In pairs, or usually in small-sized flocks, they glean a livelihood among the cold-stunted vegetation of the alpine meadows. The nine birds which I saw together had their pleasing grey and emerald plumage set off by a mass of blossoms which only the brief summers of these altitudes can bring forth—white anemones, yellow saxifrage, and blue gentians that matched the sky above the distant snow peaks.

Plate VI. NORTHERN BLOOD PARTRIDGE (*Ithagenes sinensis* David) *Facing page* 36

Painted by G. E. Lodge.

Five hundred miles north of the Himalayas, on the alpine slopes of the Nanshan ranges, lives the Northern Blood Partridge. The Chinese call it Song-hoa-ky, the flower bird of the firs; and its soft pastel crimson, emerald russet and grey merit well the name. They spend their life among low firs, among thickets of stunted willows and mountain ash. Few white men have seen them, but the Chinese hunters find their coveys easy to approach, for they know little of mankind and fear only the eagles and foxes and leopards which are ever on the lookout for them.

Plate VII. THE SATYR TRAGOPAN (*Tragopan satyra* Linnaeus) . . *Facing page* 48

Painted by A. Thorburn.

The place is Sikhim in the Eastern Himalayas, looking toward Kabru and Kinchinjunga; the time is early May at ten thousand feet, when spring is at its height. The Satyr Tragopans have finished their courtship and paired, and in a few days will begin to nest. From some mossy perch the booming crescendo challenge of the cock rings out every morning. Around him the rhododendron trees are masses of colour; scarlet, salmon, cerise, pink and rose, and beneath, the ground is lavendered with alpine primroses. Words can never describe the beauty of this magnificent bird in its Himalayan home.

Plate VIII. TRAGOPAN PLUMAGES (*Tragopan satyra* Linnaeus) . . *Facing page* 58

Drawn by H. Grönvola.

Tragopans, unlike Blood Partridges, do not acquire the adult plumage in the first year of their life.

Figure 1. The chick in the down plumage has a rich rufous head, the body being dark rufous above and pale yellow buff below. The wing feathers are well developed and the chick is able to fly a day or two after it leaves the egg.

Figure 2. A bird six weeks old has assumed full juvenile plumage, typical in pattern; a warm buffy background mottled and barred with black, with a conspicuous terminal, paddle-shaped shaft-stripe.

Figure 3. Birds in the first year plumage are quite uniform as to body, but if the moult has been late the head and neck will correspondingly be more adult in colour and pattern, as in the bird figured. Even a few days will make considerable difference in the pigment deposited, so that cocks of this age show a remarkable amount of variation.

Plate IX. WATTLES OF COCK TRAGOPANS . . . . . *Facing page* 62

Drawn by H. Grönvold.

These wonderful structures come to their full development at the breeding season. At this, as at all other times, they are usually quite invisible, being drawn up to an inconspicuous fold of skin beneath the chin, hidden by feathers. At the climax of courtship the great apron of skin becomes distended and its remarkable pigments and patterns are momentarily displayed to their full expanse before the hen.

Figure 1. Wattle of Western Tragopan (*Tragopan melanocephalus*).
Figure 2. Wattle of Cabot's Tragopan (*Tragopan caboti*).
Figure 3. Wattle of Temminck's Tragopan (*Tragopan temmincki*).
Figure 4. Wattle of Blyth's Tragopan (*Tragopan blythi blythi*).
Figure 5. Wattle of Satyr Tragopan (*Tragopan satyra*).

Plate X. WESTERN TRAGOPAN (*Tragopan melanocephalus* Gray) . *Facing page* 66

Painted by A. Thorburn.

In the mountain forests of the Western Himalayas lives this great bird, its black and crimson plumage covered with a shower of silvery stars. Its cry echoes through the gorges of Kashmir and the tumbled masses of mountainous Garhwal. A dozen are sometimes found together, and throughout the winter they keep within calling distance of one another. They are fond of the buds of trees, and thus can find sustenance even when the ground is covered deep with snow.

Plate XI. BLYTH'S TRAGOPAN (*Tragopan blythi blythi* Jerdon) . . *Facing page* 78

Painted by A. Thorburn.

The deep, hot valleys of Assam and the hundreds of miles of lowland plains are populated by many birds, but never a Tragopan is found there. A mapped diagram of the haunts of this bird would appear like a cobweb tracing of all the crests and upper slopes of the higher mountains. Here the oak forests are moss-hung and scented with orchids and jasmine. The ice-cold rivulets are beloved of these birds, and they come out from the bamboo to the mossy boulders to quench their thirst and to send forth their musical clanging cry—a challenge to battle or a summons to a mate, as the case may be.

Plate XII. TEMMINCK'S TRAGOPAN (*Tragopan temmincki* J. E. Gray) . *Facing page* 88

Painted by A. Thorburn.

Although the most widely distributed, yet this is the least known of its group. Its home is in the great heart of China, far from the beaten trails which all travellers follow, and among the oaks and rhododendrons of high altitudes. This Tragopan spends much of its time among their gnarly branches, feeds on their buds and fashions its nest in the dense foliage. Few white men have seen it wild, but the Chinese frequently trap it. They have spread out the great curious throat wattle and have found a resemblance in its pattern to one of their written characters; so to them the Tragopan is *T'so-che,* the bird of longevity.

Plate XIII. CABOT'S TRAGOPAN (*Tragopan caboti* Gould) . . . *Facing page* 100

Painted by A. Thorburn.

Hundreds of bird-lovers have this Tragopan living in their aviaries; probably less than a half dozen white men have seen it wild. In houseboat and sampan one can penetrate to their haunts in Fokien, but except for a quick shot at sight, one must have the patience and facility of a real wilderness creature to watch these wary birds undiscovered. They are surrounded everywhere in the valleys by Chinese, who plant their rice or bury their dead on every available spot. But the birds still hold their own in the face of a race which, while it has deforested the whole country, yet prefers rice and fish to a diet of game.

PLATE XIV. HIMALAYAN IMPEYAN PHEASANT (*Lophophorus impeyanus* Latham) . . . . *Facing page* 114

Painted by C. R. Knight.

From Afghanistan to Bhutan, along the whole range of the Himalayas, the Impeyan makes its home. Only the Blood Partridges live at a greater altitude. From one to three miles above the sea, the Impeyan feeds and sleeps and nests. There is beauty to be found in both the cock and the hen, but the colouring of the hen is the umber of dead leaves and the smooth brown of lichens, while the cock is a living mirror of iridescence. Yet life is possible to both amid the same surroundings; they face the same problems, make the same fight for existence in the face of dangers which threaten from the mountain slopes and from the clouds above them. And each year they rear their broods, which marks the success of their long battle against great odds. In this, they are but repeating the life of the generations before them; for the Impeyan chain is a long one. It reaches back unnumbered years to that mysterious time before the first men appeared—and the first links were formed long, long before human beings were present to watch the progress of this slow but courageous evolution.

PLATE XV. PLUMAGES OF THE HIMALAYAN IMPEYAN PHEASANT (*Lophophorus impeyanus* Latham).

This plate will be found at the end of the fourth volume.

PLATE XVI. CHINESE IMPEYAN PHEASANT (*Lophophorus lhuysii* Verreaux and St.-Hilaire) . . . . *Facing page* 148

Painted by G. E. Lodge.

In the heart of Central China, wandering over a limited zone of the highest mountains, this bird is making a brave fight for existence. The Chinese trap it on every occasion, and it is hardly possible that it can exist for many more years. No white man has seen it alive. The Chinese, inspired by the beautiful metallic lustre of the feathers, call it Ho-than-ky, the fowl-of-burning-charcoal.

PLATE XVII. SCLATER'S IMPEYAN PHEASANT (*Lophophorus sclateri* Jerdon) . . . . *Facing page* 152

Painted by G. E. Lodge.

The least known of all the Impeyans is this curl-crested bird, clad in shimmering gold, green and blue iridescence. Until now, only the wild tribes of Aborland have known where to find it, and the few skins in our museums have been secured by them. After a day of difficult exploration, I found three of the Impeyans deep in the wilderness of northern Yunnan. One I secured and the two others boomed away over the bamboos, far off into the distant valley. Their haunts are so well guarded by savage tribes that it may be impossible to see them before the birds become extinct. So limited is the region they inhabit, so narrow are the upper ridges on which they make their home, there can be but few of them alive in the world.

PLATE XVIII. BROWN EARED-PHEASANT (*Crossoptilon mantchuricum* Swinhoe) *Facing page* 164

Painted by G. E. Lodge.

On a cold day in early April, on a tundra-like expanse far beyond Pekin, I watched this flock of Eared-Pheasants drift past. Around my umbrella tent, tiny voles appeared whenever the sun shone; buntings and wagtails dashed down for a few minutes, feeding; small, timid musk deer walked slowly downward toward the stream at the valley bottom. The pheasants fed as they moved, gathering about some tuft of grass and uprooting it with their stout beaks to search the loam for grubs and tubers. They did not suspect my presence, they uttered no sound, and in a few minutes they had passed out of my sight for ever.

PLATE XIX. BLUE EARED-PHEASANT (*Crossoptilon auritum* Pallas) . *Facing page* 178

Painted by G. E. Lodge.

The mountain slopes of north-eastern Tibet, with their larch, cedar and birch woods, are the roosting places of these birds, which by day come out into more open zones where growths of low bamboo, rhododendron, hawthorn and wild rose afford protection for their nests. The Chinese farmers set traps innumerable, for the central tail feather of the Eared-Pheasant is the badge of authority for the military leaders and therefore brings a high price. Year by year the birds are becoming rarer, and it is not likely that they can hold their own for a much longer period. They live in pairs during the summer, but in autumn unite in good-sized flocks. When the snows come, these birds work downward into the lower valleys and roost close together among the upper branches of the tallest trees.

Plate XX. WHITE EARED-PHEASANT (*Crossoptilon tibetanum* Hodgson) *Facing page* 184
Painted by G. E. Lodge.

Although clad dominantly in white, these pheasants do not live in the snow, but retreat before the early storms of winter downward into the valleys. Their home is in south-eastern Tibet and central China, among the wildest mountains. Except in the breeding season they are gregarious, living in flocks and often associating intimately with the tiny musk deer. They keep to thick cover and are ever on the watch for the great eagles which swoop down upon them without warning. The Tibetans of this region are very superstitious and allow no animals and birds to be killed when they can prevent it. So the race of "Shaggas," as they are called, has a good chance for existence as long as the lamas wield this kindly influence.

PHOTOGRAVURES

Photogravure 1. THE EASTERN HIMALAYAS . . . . . *Facing page* xx
Photograph by William Beebe.

The most wonderful scene in the world is the Himalayan snows from Darjeeling. Sitting at the edge of the moss-hung forest at about seven thousand feet, one sees, through a filigree of tree ferns, range after range, extending through green and blue and purple distance up to the sharp edge of the snow line. The apex of all is Kinchinjunga, with beautifully draped Kabru far to the left. Six species of pheasants live in these glorified hills.

In the deeper valleys, where the chill of the snows never comes, are Red Junglefowl and Peafowl. In the upper forest, Black-backed Kaleege roost and nest. Still higher, near the snows, at nine or ten thousand feet, are the Satyr Tragopan and the Impeyan—most gorgeous of birds. The last of the sextet lives at fourteen or fifteen thousand feet—at the very edge of the snows. This is the Blood Partridge.

Photogravure 1a. WINTER HOME OF THE NEPAL HIMALAYAN BLOOD PARTRIDGE . . . . *Facing page* 10
Photograph by William Beebe.

In the Eastern Himalayas the limit of perpetual snow is at sixteen thousand feet, and in winter the storms rush down from the crests and sweep everything before them to tree level. Even the hardy Blood Partridges have to retreat and seek shelter and food several thousand feet lower down. Here the great pines and spruces defy the elements, rearing their sturdy gnarled trunks and spreading wide their scraggy branches. Between their trunks extend dense masses of stunted rhododendrons, and among these the Blood Partridges spend the long winter days. From the pines come the voices of titmice and nuthatches and creepers, and now and then the shadow of a passing vulture cuts through the icy air. Only lonely Nepal shepherds ever visit these slopes. It matters not to the birds that farther down in the valley there is warmth and insect life. There too are safe roosting places. The Blood Partridges will have none of these, but cling to the edge of the tree-line, ever ready to work upward at the first hint of spring.

Photogravure 2. SUMMER HOME OF THE SIKHIM HIMALAYAN BLOOD PARTRIDGE . . . . *Facing page* 20
Photograph by William Beebe.

Three miles above the sea in the Himalayas the air is rarified, the sunlight is brilliant, the flowers masses of intense colour. The frost splits the rocks and the storms beat upon them with hail and scatter them piecemeal. In the alpine meadows only those low growths find foothold which are pliable and willing to bow before the blasts.

Tussocks of coarse tundra grass, slender lily stems, creeping juniper holding with knotted fingers to every crevice—these give the touch of life. And to this desolate zone come the Blood Partridges in spring, and here they nest among the shrubs in sheltered gullies, and search among the tussocks for seeds and insect life, or dust themselves in the rock débris on the leeward sunny side of the great jagged ridges.

Photogravure 3. HOME OF THE NORTHERN BLOOD PARTRIDGE *Facing page* 26

Photograph by William Beebe.

An alpine feeding ground of Blood Partridges in the autumn. When the snow melts on the Nanshan Mountains in north central China a dense growth of plants springs up, and in midsummer these meadows are ablaze with colour. The Blood Partridges nest among the blossoms and pluck the buds and scratch up the shallow-rooted plants for grubs. As autumn approaches, the petals fall and the meadows become covered with a myriad seed cases, hard-seeded berries, and fluffy-topped everlastings. Then the Partridges pass back and forth with their broods, brushing off the filmy seeds, restless and ever ready at the first blackening frost to retreat to lower levels.

HOME OF KUSER'S BLOOD PARTRIDGE

In northern Yunnan, the winds from the snows find their way over the passes along narrow paths. On either hand, rugged oaks and pines are able to keep a roothold, but in the sweep of the icy blast nothing can grow but low, stunted bamboos and coarse grass. The Blood Partridges live at these altitudes, roost among the trees, but find their food in the flower-dotted expanses of the close-cropped upland meadows.

Photogravure 4. HIMALAYAN HOME OF THE SATYR TRAGOPAN *Facing page* 52

Photograph by William Beebe.

In early morning the swish of a lammergeier's wings is heard through the close-lying clouds, and the croak of a Himalayan raven comes faintly. Then a Satyr Tragopan calls and the mist sweeps from the valley. The snows are still hidden, but we see the slopes covered with a dense forest of rhododendrons and magnolias. Through the day these birds feed among the underbrush, and if they escape the eye of eagle and cat, and avoid the snares of the Nepalese shepherds, they will roost at night in some safe perch, high above the dangers of the earth.

Photogravure 5. BREEDING HAUNTS OF THE SATYR TRAGOPAN *Facing page* 56

Photograph by William Beebe.

When the Tragopan makes its nest it leaves the more open forested slopes and descends some steep, cool ravine. Here the bamboo grows on either hand in ranks so dense that a man cannot force his way through. The heart of the ravine is clear, the rushing torrents in early spring having swept every growth away save moss and rock-clinging patches of grass. Here a trickle of icy water tinkles its way downward to the river far below, and within sound of its drops the Satyr hen lays her eggs. They are well hidden in the heart of the friendly bamboo and rhododendron scrub. The silicious stems rise in serried rows in all directions, presenting a sheaf of spear-tips to the soaring eagle, and the crackling of the dried fallen leaves reveals the approach of every marauder. Only occasional Tibetans straggle along the distant trails, and the dull-hued hen sits safely and finally leads forth her brood for their first drink in the depths of the rocky ravine.

Photogravure 6. HAUNTS OF THE WESTERN TRAGOPAN . . *Facing page* 72

Photograph by William Beebe.

Steep mountain sides of rugged, outjutting rocks, where only turf and saxifrage can find roothold; more gentle slopes covered with sombre forests of deodars and silver firs; park-like vistas of emerald lawns starred with hosts of strawberry blossoms; such is the home of the Western Tragopan. In the warm sunshine the chicks spread wide their plumage, and lying on their sides lazily kick the dust over their little feathers. With the cool onrush of cloud shadow they shake themselves and hastily preen their disarranged plumage. When the storm from the Tibetan upland breaks, the little Tragopans scuttle for shelter beneath the ample wings of the gentle grey mother.

Photogravure 7. YUNNAN HOME OF TEMMINCK'S TRAGOPAN . *Facing page* 94

Photograph by William Beebe.

A cock Temminck's Tragopan was perched on the dead stub in the right-hand foreground ten minutes before the picture was taken. It leaped down and I secured it among the everlastings and bamboo stubble of the lower photograph. This was a typical Chinese wilderness devoid of trails or evidence of mankind, while the vegetation was gnarled and seared by the blasts which ever swept down from the snows. It was autumn, and the leaves and trunks were as colourless as the overcast sky. Against this background the magnificent bird showed like a glowing coal.

Photogravure 8. CHINESE HOME OF CABOT'S TRAGOPAN . *Facing page* 104

Photograph by William Beebe.

The distant Min River flows through Tragopan country, whose mountain slopes are studded with pine saplings and spots of gorgeous azaleas. The second-growth and tangled turf and dwarf bamboos make rapid progress impossible for anything larger than a pheasant.

Into this cleared space there dashed, without warning, a cock and hen Tragopan; they zigzagged back and forth, encircled the berry-covered tree and vanished into the scrub. The foliage dripped, the fog soon shut tightly down, and to my ears came only the occasional whirring of the moisture-laden wings of some passing small bird.

Photogravure 9. EASTERN HIMALAYAN HAUNT OF THE IMPEYAN

Photograph by William Beebe. *Facing page* 122

At the climax of three mountain ranges in eastern Nepal, a mighty boulder juts out from the steep slope. It is painted with lichens, encrusted with moss, and in a narrow shelf on its sheltered side a trio of Impeyans roosted. This roosting place, at an altitude above the limit of trees, was an isolated haven of safety, out of the reach of martens, foxes and wild dogs. The birds were crowded close together on the thick, soft cushion formed by the alpine moss, and above them there were the leaves of a tiny rhododendron which had found a foothold in a little crevice. Early in the morning before the full sunlight would expose them to a passing eagle, the three would leap outward and scale down for their morning drink at a snow-fed torrent.

Photogravure 10. WESTERN HIMALAYAN HOME OF THE IMPEYAN *Facing page* 130

Photograph by William Beebe.

Two miles above the sea, in the coniferous forests of Garhwal.

Between a jagged bit of rock and a sturdy deodar, I crouched early in the morning, every needle and leaf about me drenched with dew. Behind were six ranges of mountains, dropping away from the fathomless valley at my feet, and yet rising ever higher and higher to the distant Tibetan snows.

Before me was a glade surrounded by small trees, and having the appearance of recent ploughing or of thorough trampling by the hoofs of a great herd of cattle. This was a feeding ground of cock Impeyans, and within an hour on this particular morning fourteen full-plumaged birds appeared. Wielding their beaks like picks, they dug deep holes and overturned clumps of turf in their eager search for grubs and succulent tubers. Probably each had a mate somewhere in the surrounding forests brooding her eggs, but each morning these birds, too gaudy to dare to approach their nests, came here for a social meal, then separated to feed alone during the remainder of the day.

Photogravure 11. NEST AND EGGS OF THE IMPEYAN . . *Facing page* 136

Photograph by William Beebe.

At the base of an ancient, weather-beaten stub, half hidden in a mass of Himalayan ivy and maidenhair fern, a hen Impeyan had made her nest. She would never have been revealed had not a crested tit discovered and scolded her. In the cool air of these high Garhwalese forests, I watched the bird day after day. During her brief absence, I photographed the two great spotted eggs. The succeeding day I surprised a group of bander-log—the great grey Langur monkeys—and one of them had stolen the spotted eggs and was climbing up a slanting tree-trunk. The lives of the two young Impeyans were thus snuffed out; the spring courtship, the battles of the cock, the care on the part of the patient mother, all had been of no avail.

Photogravure 12. YUNNAN HOME OF SCLATER'S IMPEYAN . *Facing page* 156

Photograph by William Beebe.

The steep slope of sprouting bamboo was most terrible to climb. I made my way through the shaded ravine running obliquely upward through the centre. On the way up, I found innumerable traces of barking deer and Silver Pheasants, and I disturbed a king cobra from his den at the foot of a wild banana. At the summit, beyond a tangle of caladiums and painted leaves, I encountered the three Impeyans, the first wild birds ever seen by a white man. The full-plumaged cock was scratching among the undergrowth shown in the lower photograph, and at my blind shot fell in the same place. The others flew up a few feet beyond and scaled out of sight down the opposite slope.

PHOTOGRAVURE 13. NORTHERN CHINA — THE HOME OF THE BROWN EARED-PHEASANT . . . . *Facing page* 168

Photograph by William Beebe.

The haunts of this bird are guarded neither by dense tropical jungles nor savage tribes, but by bleak inhospitable wastes, where shelter and food are unknown. The sharp stones cut the feet of the palanquin bearers until the path is bloody. To find the birds themselves, one must leave all attendants behind and search day after day over the semi-barren tundras, hiding behind scrubby growths of vegetation to scan every rock and shadow.

The only inhabitants of this region are nomadic Tartars, whose sole possessions are their flocks of black-headed sheep. Now and then these wandering men bring a small herd to Pekin to exchange for the necessaries of life. Their fathers and grandfathers before them have done this selfsame thing, have followed the dim, stony trails which converge toward the old gateway in the Great Wall—until the path under the gateway has been worn smooth by the passing caravans of over twenty-one centuries. Now and then the most ragged of the shepherds will have the tail feather of an Eared-Pheasant stuck jauntily in his rough skin cap.

PHOTOGRAVURE 14. THE HAUNTS AND THE HUNTERS OF THE BROWN EARED-PHEASANT . . . . *Facing page* 174

Photograph by William Beebe.

A thousand photographs of the home of this bird would seem to be nothing more than pictures of the same place. There is nothing more to be seen than coarse grass and straggling weeds, touched by scattered flowers in the spring, and covered lightly by drifting snow in the early autumn. The bare rocks are lichened and have become the colour of half-frozen soil. In such an environment the Eared-Pheasant lives happily and holds its own even against the Chinese pot-hunter, the circling eagles and the stealthy leopards. With antiquated gun but Oriental patience, the Mongol hunter pursues his game and never misses. Only the vast extent of these desert regions and the wandering habits of the birds have saved them from complete extinction.

PHOTOGRAVURE 15. HOME AND FEEDING GROUND OF THE WHITE EARED-PHEASANT . . . . *Facing page* 190

Photograph by William Beebe.

Climbing upward from a cool, dark ravine in northern Yunnan, I passed through zones of moss-hung oaks and rhododendrons to frosted, stunted willows and dwarf bamboos. Looking back down the forest-covered slopes, I saw three White Eared-Pheasants step out into a glade. They watched me, and they watched a great black eagle which hung high overhead, and they stood poised so that they could dash to safety into the undergrowth. Finally a mist drifted across the valley—a wisp of cloud as white as the birds themselves. Swiftly as it had formed, it dissolved again, and when it had passed, the pheasants had vanished.

Descending to the spot, I found their tracks at the foot of a gnarled-rooted trunk amid a tangle of dying jack-in-the-pulpit and forest débris. That night, when I crawled into my sleeping-bag, I knew that somewhere far off perched among the rough, knobby branches, were these birds of purest white, their soft plumage matted with moisture, their heads drawn back in soundest sleep.

MAPS

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INTRODUCTION

THE readers of such a monograph as this, are attracted either because of the pleasure they find in the beauty and grace of pheasants; from the interest of keeping them in captivity or on preserves; from the enthusiasm of a sportsman; or for reference in ornithological research. With this in mind, I have arranged the text so as to afford equal facility to all these varied interests.

The natural history of the pheasants is the dominant theme; their wild life and the part they play in the scheme of nature in their Asiatic haunts. Hence I have striven to put this phase to the fore in the cases both of general and specific treatment.

In the present volume I have written a brief synoptic account of pheasants as a whole, reserving the details of their care in captivity for a chapter in the final volume. In treating of the various species, a brief description of the adult birds precedes each account, the more intimate details of plumage, moult and variation, together with the synonomy being readily accessible at the end of each species monograph.

In the preparation of any work of a monographic character, there comes to the writer, sooner or later, the feeling that his part in it is small indeed compared to the great company of others who have aided him. From the philosopher who passed away many decades ago but whose written word is still an inspiration, to the naked Dyak who proudly comes bearing a trapped bird to Tuan—a gift not for money, but as from one hunter to another—between these extremes there extends a long roll whose aid is given freely and for sheer love of the wilderness folk.

The friendship and unselfishness of Col. Anthony R. Kuser throughout the undertaking are not to be measured by praise or verbal gratitude. It is my hope that the work itself may be a token of appreciation. To Dr. William T. Hornaday, Prof. Henry Fairfield Osborn, Madison Grant and to the members of the Executive Committee of the New York Zoological Society I am indebted for leave of absence and unfailing interest and help. To Major Henry Jones of London, whose gift of a set of paintings of the genus *Phasianus* was as generous as it was valuable. Among the host of friends throughout Europe and the Far East, two names stand out, both heads of museums, who welcomed an American ornithologist and provided him with every available aid in their power. These are Dr. Arthur Willey of Colombo, Ceylon, and Dr. Nelson Annandale of the Indian Museum, Calcutta.

For seventeen months I travelled in Asia and the East Indies, studying the pheasants in their native haunts, and was fortunate enough to find and study every one of the nineteen genera of these birds which I recognize in this work.

In the eastern Himalayas, from the terai of Nepal, Sikhim and Bhutan to the southern border of Tibet, I found the Black-backed Kaleege, the Impeyan, the Satyr Tragopan, and, high up near the snows, the Blood Partridges. Here I travelled on horseback and afoot and worked with the aid of sturdy Tibetan men and women, of

Bootias and of Nepalese shepherds. Far to the west, among the spruces and deodars of Garhwal, and Kashmir, I took horse and dandy and tonga and found wild hillmen of unknown tribes waiting to help in the search. Here again I met the royal Impeyan, and in addition the White-crested Kaleege, the Cheer, the Koklass, and the Western Tragopan. The Indian Peafowl and the Red Junglefowl rewarded days of labour in the terrible heat of the Plains, and the same Peafowl but another Junglefowl in Ceylon, where I voyaged in outrigger canoes and lumbering bullock-carts, and hunted with gentle-faced Tamils and hideous Veddahs. In Burma appeared the Bar-tailed and the Peacock Pheasants, Horsfield's Kaleege, the Lineated and the Silvers, and along the border of Tibet and Yunnan, the rare Sclater's Impeyan, Temminck's Tragopan and a new species which I have called Kuser's Blood Partridge. Here I saw the White Eared-Pheasant and the Amherst Pheasant along the mountain torrents, and here the men were as wild as the pheasants, and the Lolos and Kachins and mongrel Chinese rolled down rocks on my trail by day, and shot poisoned arrows by night at my Ghurka sentries. In the Malay States, in the humid, leech-ridden jungles of Selangor, Penang and Johore I found the Ocellated and the Great Argus, the Green Peafowl, the Crested and the Crestless Firebacks; and, higher up among the mountains, the Bronze-tailed Peacock Pheasants. Here were no natives to help, the Malays too slothful and the Sakais too timid and wild, and my memories of those heart-breaking but happy all-day tramps are solitary ones. From end to end of Java I searched for the one-wattled Junglefowl, to find it at last at very sea-level. Then wonderful weeks in a Dyak war-canoe, through forests and over rapids, took me to the heart of Borneo, to the home of the White-tailed Pheasant and the dancing arena of the Grey Argus. Three separate expeditions were made into the interior of China, the first through Fokien, by houseboat, then up the Yangtse, and the final one through the plague zone and by palanquin and horse out into the desert regions beyond Pekin and the great wall. These brought me unforgettable glimpses and unexpected knowledge of the true Ring-necked Pheasants, of the Chinese Silver, Cabot's Tragopan, the Reeves, and the Brown Eared-Pheasant. A Japanese reconnaissance revealed all the forms of pheasants living on those islands, the Green Versicolour, and the Copper in its various subspecies.

I should never have undertaken such a work as this on any group of birds which I had not studied in their wild home. And now that I look back on the splendid pheasants in their varied surroundings, I think of them as friends, as fellow living organisms on this earth, whose companionship has brought both joy and sorrow, but whose lives have always been a stimulus to hard, honest work; the toil of the explorer and the field naturalist, with extremes of exaltation and of physical pain which no dweller in cities can ever realize.

Handicapped as the pheasants are by long tails, decorated wings, ruffs, and the most brilliantly coloured feathers, covering flesh beloved by every carnivore from man to marten, these wonderful birds have found a place for themselves on mountain, plain and island, and by exercise of the keenest of senses, have outwitted their foes and overcome physical characters which long ago would have doomed less virile groups of birds to extinction.

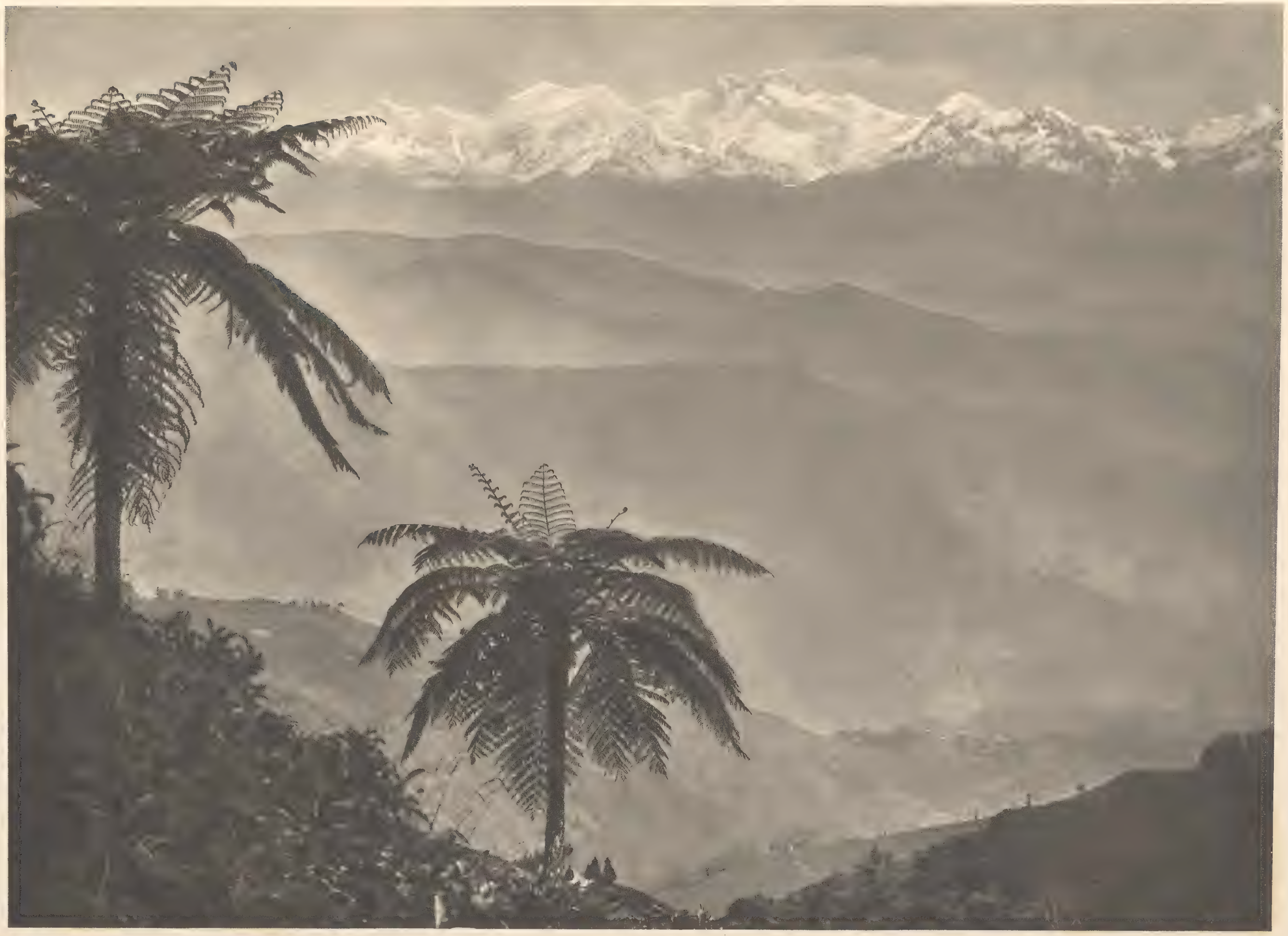
My survey of their haunts made me pessimistic in regard to their future. In India there seemed a slight lessening among the natives of the religious regard for wild

PHOTOGRAVURE I

THE EASTERN HIMALAYAS

The most wonderful scene in the world is the Himalayan snows from Darjeeling. Sitting at the edge of the moss-hung forest at about seven thousand feet, one sees, through a filigree of tree ferns, range after range, extending through green and blue and purple distance up to the sharp edge of the snow line. The apex of all is Kinchinjunga, with beautifully draped Kabru far to the left. Six species of pheasants live in these glorified hills.

In the deeper valleys, where the chill of the snows never comes, are Red Junglefowl and Peafowl. In the upper forest, Black-backed Kaleege roost and nest. Still higher, near the snows, at nine or ten thousand feet, are the Satyr Tragopan and the Impeyan—most gorgeous of birds. The last of the sextet lives at fourteen or fifteen thousand feet—at the very edge of the snows. This is the Blood Partridge.



EASTERN HIMALAYAS ; THE HOME OF SIX PHEASANTS.

life which has been such a boon to the birds in this densely populated part of the world; in the Malay States and elsewhere great rubber plantings threaten the whole fauna of some places; in Nepal and Yunnan the plumage hunter is working havoc; in China the changing diet from rice to meat and the demand in Europe for shiploads of frozen pheasants has swept whole districts clean of these birds. And everywhere unwise and unseasonable shooting and trapping by the natives has told heavily. For some of the pheasants there seemed but short shrift.

A new, wholly unexpected change has now come to pass, and the terrible history being made in Europe will mean a new lease of life to the creatures of the Eastern jungles. The demand for rubber and for the luxury of frozen pheasant will lessen; the milliner for a time will be unable to sell his ill-gotten wares; the pressure of Caucasian influence will lighten temporarily, the influx of foreign capital will dwindle, and in a thousand places intended clearings will be abandoned, projected buildings will be deserted. The deep call of the Tragopan and the crow of the Kaleege will increase in volume throughout the jungles of the East, and the birds will return to places from which the inroads of man had driven them. This breathing-space, this far-flung influence of war, may be the last pause in the slow, certain kismet which, from the ultimate increase and spread of mankind, must result finally in the total extinction of these splendid birds.

PHEASANTS: A BRIEF GENERAL ACCOUNT

Twenty-five centuries ago long-tailed, ground-loving birds of brilliant plumage were abundant along the banks of the rivers flowing from the Caucasus Mountains into the Black Sea. Aeschylus tells us this district was called Colchis and the principal river the Phasis. Both the Greeks and the Romans knew these birds, esteeming them for their flesh, and calling them Φασιανός όρνις or *Phasianus avis* —the bird of the Phasis. Even to-day we speak of them and their allies in the almost similar word—Pheasant. The root remains the same, whether as a Frenchman we say *Faisan*, as a German *Fasan*, or as an Italian *Fagiano*.

Pheasants were painted and embroidered on very old Chinese paper and silk tapestries perhaps a thousand years before the Greeks knew of them—pheasants of other kinds, such as the Golden and the Silver. But our knowledge of these early records is very vague.

Of even less definite report, though of far greater interest, are the giant pheasants which flapped their wings and crowed, nested and laid their eggs in the strange old Miocene days, when mammals, from shrews to mastodons, were in their prime. This was when the sabre-toothed tigers and huge primitive dogs pursued tapirs and the tiniest of deer over what is now the pleasant southland of France, from the Garonne to the Pyrénées. Forever lost to us are the colours and patterns and habits of these pheasants of old, but from their bones we know that some of them were larger than any living to-day. These and a few more recent fragments are all the evidence we have of the countless generations of birds which preceded the magnificent pheasants living at present on the earth.

It seems probable that the more immediate ancestors of the pheasants lived in

Asia, perhaps near the Himalayas, but during the Miocene a wave of life flowed from Asia into Europe, and the fossils which have been found were doubtless of members of this invasion. In the course of time these pheasants died out in Europe and all those which are now found there have been transported from Asia by man.

Our knowledge of the lives of the pheasants has thus far been of the most fragmentary character. Forty-five years ago the sum total of human knowledge in this field was crystallized in a "Monograph of the Phasianidae" by Dr. Daniel Giraud Elliot. In my research, his monograph has served as a starting-point. Since 1872 no publication of importance has appeared which has been devoted to these birds alone. The only work of wider scope worthy of mention from the point of view of originality is Hume and Marshall's "The Game Birds of India, Burma and Ceylon," published in 1879. From the point of view of life histories this work has been copied systematically ever since, and very little added.

Starting out with the scattered information revealed by a search of ornithological literature, I have endeavoured to round out as fully as possible the lives of these wonderful birds. And with whatever success I may have attained, is always the synchronous realization of how much there is still to learn. Of their evolution, of their forms, colours, habits, enemies, instincts, I can present as yet the merest outline. Their dangerously little knowledge gave to the earlier naturalists dogmatic assurance in the face of all these tremendous problems. To-day we have come to have the greatest faith in the scientist who dares to say "I don't know"; who, without setting forth half-considered theories of his own, is willing to search for the modicum of truth which lies hidden at the bottom of some of the even more improbable theories championed by his confrères; and finally, who has the intuition to realize and the courage to admit the operation of *unknown factors*, which it is the object of our life work to discover.

My views on the evolution of the pheasants have become ever broader, more plastic as my studies have progressed. I lean less and less upon any one explanation or theory, and seem to see cases of the operation of several, and the shadowy indications of others of which as yet we have no concrete conception. Again I emphasize the fact that we may be certain that there was no such thing as linear development of group after group. Whatever or however changes have taken place they have been radial: variations in all directions; attempts to make successes in life in every conceivable niche and manner. The true pheasants, typified by the so-called English Pheasant, show, between their numerous forms, gradations so delicate that there is no question of their origin other than by continuous variations. In the Black-throated Golden and the Black-shouldered Peafowl we have undisputable cases of mutation. In the origin and significance of the successive changes of plumage of the White-tailed Wattled Pheasant of Borneo; of the train of the Peacock and the wings of the Argus; of the clothing of a dull pheasant hen with all the glories of her mate simply as the result of disease or age, we are in the face of mysteries, wholly inexplicable. The explanation of any one of these would satisfy the *raison d'être* of a lifetime of labour. But one must be content to acquire merit by adding even a handful of material to the great structure, and so it only be sincere and true it shall be well worth while.

Pheasants are members of the great group of gallinaceous or fowl-like birds, a group which has been recognized with more or less precision since the time of Linnaeus. The earlier naturalists knew them as Rasores, or scratching birds, from their universal habit of digging among leaves or into the ground with their claws, and uncovering the seeds and grubs and worms upon which they feed. But this was too superficial a character to hold any group of birds together. Many unrelated birds, such as our white-throated sparrow, could qualify as members on this criterion.

At first thought it would seem as if there could never be any doubt as to the identity of a pheasant, or even a gallinaceous bird. But, unlike such completely isolated groups as penguins, owls and tinamous, the Galliformes have outliers or hangers-on which in general character are linked with members of other orders. Until either we unearth much more significant fossil material than has heretofore been discovered, or until the embryology of scores of species has been thoroughly worked out, we must regard these lines of relationship as mere hints, evanescent twigs and branches connecting the foliage of living species of birds.

Considering the group as a whole, the Galliformes, or fowl-like birds, are unquestionably low in the scale of avian evolution. In spite of their fine feathers and elaborately specialized plumage characters, neither anatomically nor mentally are they of high rank. They appear also to occupy a rather central place, near the focus of many lines of avian radiation. Of still more arrested development and showing a certain degree of relationship is the strange hoatzin, which leads dimly but certainly in the direction of the touracous and cuckoos. The hemipodes are another outlying group, evidently a terminal branch. The sand grouse still more certainly point the way from the Galliformes to the pigeons. And thus we strive to orient the various groups, and must always fail unless we consider them divorced from all linear classification, and as organisms radiating in the three planes of space.

One hundred and fifty-eight years ago Linnaeus gave us a fairly homogeneous group which he called Gallinae. This consisted of five genera and twenty-five species. Seven of these latter come within the scope of this monograph—

Pavo cristatus	Indian Peafowl.
Pavo bicalcaratus	Grey Peacock Pheasant.
Meleagris satyra	Satyra Tragopan.
Phasianus gallus	Red Junglefowl.
Phasianus colchicus	Common Pheasant.
Phasianus pictus	Golden Pheasant.
Phasianus nycthemerus	Silver Pheasant.

Sharpe, in what is perhaps the best of the later general classifications of birds, recognizes a suborder Phasiani, with five families: Tetraonidae, Phasianidae, Numididae, Meleagridae and Odontophoridae. The second family is the one which concerns us. It embraces the partridges and quails of the Old, and the grouse of the New World, the snow cocks, red-legged partridges, francolins, tragopans, pheasants of all species, junglefowls, and peafowl. Of the fifty-one genera into which Sharpe divides this assemblage, I have included only twenty-two in this monograph, and these I have reduced to nineteen. The attempts to subdivide this family have heretofore been of necessity frankly tentative and speculative, or based on some superficial character which invariably presented an incongruous exception. Of the first type of effort we may instance Dr. Elliot's grouping in his monograph published over forty years ago, and of the second the selection of the relative length of the flight feathers, to the logical application of which the most typical and important genus *Phasianus* offers an insuperable exception.

We hear constantly of the artificiality of classification, of the makeshifts of genera and species, but seldom is the absolute truth of this realized until we have an intensive study of some limited group of organisms. As regards importance of definitive characters in family, genus and species of Pheasants, we can in many cases compare them respectively only with genera, species and subspecies of mammals or reptiles.

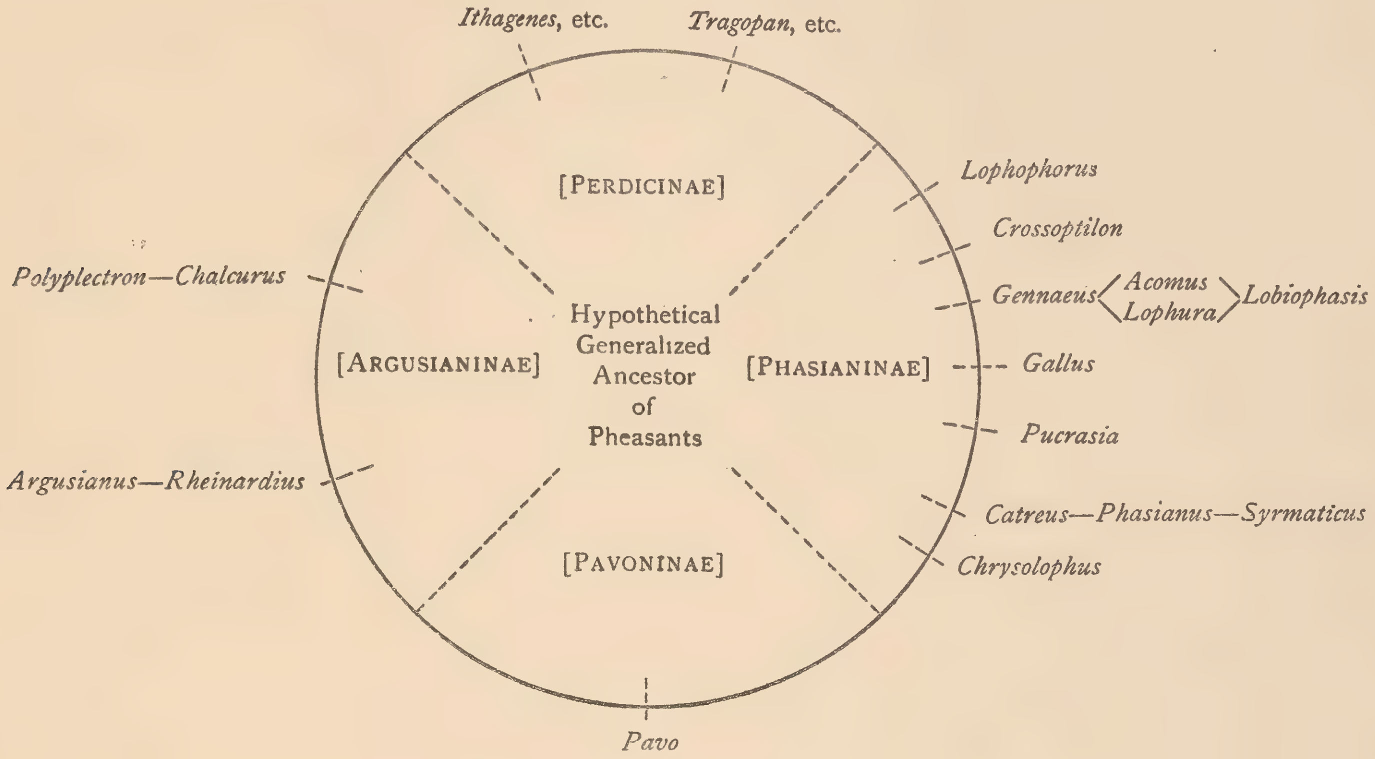
As I have said, there has been little attempt, and that of a wholly artificial character, at classification of the Pheasants on any scale higher than genera, and the most thorough search I could make revealed no consistent differences in either bones or muscles, length or number or colour of feathers. Finally, I came upon a character, external and transient, but in rhythmical return and in consistency well worthy of consideration. I found that each year there was a regular sequence in the moulting of the tail-feathers and that this held good throughout the life of the bird, the individuals of the species and the members of the genus. In addition, it agreed closely with the assumed relationships which had heretofore been taken for granted.

Thus I have distinguished the following groups—

Subfamily PERDICINAE (Quail-like) [Tail moult centrifugal, from the central feathers outward.]	Blood Partridges	*Ithagenes.*
	Tragopans	*Tragopan.*
Subfamily PHASIANINAE (Pheasant-like) [Tail moult centripetal, from the outer feathers inward.]	Eared-Pheasants	*Crossoptilon.*
	Impeyans	*Lophophorus.*
	Kaleege and Silvers	*Gennaeus.*
	Crestless Firebacks	*Acomus.*
	Crested Firebacks	*Lophura.*
	White-tailed Pheasant	*Lobiophasis.*
	Junglefowl	*Gallus.*
	Koklass Pheasants	*Pucrasia.*
	Cheer Pheasants	*Catreus.*
	True Pheasants	*Phasianus.*
	Long-tailed Pheasants	*Syrmaticus.*
	Golden and Amherst	*Chrysolophus.*
Subfamily ARGUSIANINAE (Argus-like) [Tail moults 3rd from the central pair outward and inward.]	Bronze-tailed Peacock Pheasants	*Chalcurus*
	Peacock Pheasants	*Polyplectron.*
	Ocellated Argus	*Rheinardius*
	Argus Pheasants	*Argusianus.*
Subfamily PAVONINAE (Peafowl-like) [Tail moults 6th from the central pair outward.]	Peafowl	*Pavo.*

There is a certain amount of variation in the moults of the Argusianinae and Pavoninae which tends to amalgamate these two groups, but for the present I shall keep them separate.

Further than this it is impossible to go in linear classification. Whatever may have been the generalized ancestor of the pheasants, the nineteen groups in which we are interested have evolved more or less radially, and, considered as terminal living foliage on the tree of evolution, all are equally distant from that common ancestor. In only a few can we with certainty discern a certain linking relationship, which might partially be expressed in supergenera. We more nearly approximate the truth in such a schematic arrangement as this, which at least has the advantage of two planes of space—


Ithagenes, etc.
Tragopan, etc.
[PERDICINAE]
Lophophorus
Crossoptilon
Polyplectron—Chalcurus
Gennaeus
Acomus
Lophura
Lobiophasis
Hypothetical Generalized Ancestor of Pheasants
[ARGUSIANINAE]
[PHASIANINAE]
Gallus
Pucrasia
Argusianus—Rheinardius
Catreus—Phasianus—Syrmaticus
[PAVONINAE]
Chrysolophus
Pavo

The first two groups of birds which I have included in the present work—the Blood Partridges and Tragopans, judged by the tail moult and other characters as well, are on the quail and partridge side of the line, but I have included them as representing the genera most nearly allied to the pheasants.

As regards the twelve genera in the subfamily Phasianinae, it is impossible to arrange them relative to one another in any system excepting one involving the three planes of space. All show inter-relations of an exceedingly intricate character.

I begin this family with the Impeyans because they show something in common with certain genera of the *Perdicinae*, and because certain fossil bones present characters slightly suggestive of this group. Otherwise they stand alone. This isolation is true of the next genus, the Eared-Pheasants, to an even greater extent, although the shape of the tail rather allies them to the succeeding genera. The next four groups, all with arched, compressed tails, show indisputable relationship; in shape and carriage of the tail, in the plumage ontogeny, in sexual colours and in eggs and voice. These are the Kaleege and the Silvers, the Crestless and Crested Firebacks, and the White-tailed Wattled Pheasant. The Junglefowl are faintly reminiscent of the above, but, on the whole, isolated. The Koklass stand by themselves as if in mutational segregation, but introduce less abruptly than any of the foregoing groups, three great genera of splendid pheasants—birds with tails flat, straight and usually of great length. These are the Cheer, the true Pheasants and the long-tailed Reeves, Copper, Mikado and Bar-tailed, which I have grouped together. Finally, we have the Golden and Amherst—of mysterious relationship, magnificent twins from the depths of western China.

In the subfamily Argusianinae, two well-marked subdivisions are recognizable: the

Peacock Pheasants and the Argus, each composed of two genera, one less and the other more specialized.

At the end, in veritable regal isolation, come the Peafowl.

If the human manipulation of classifications were of paramount interest, a volume might be written on the genera of pheasants alone. A suggested genus could doubtless be found somewhere in ornithological literature for every species which we recognize to-day. And each would represent the personal bias of some author, sincere enough probably, but for the most part handicapped by lack of perspective, and especially by the failure of general application which thorough comparison with all the other genera would yield. No matter what character or characters are chosen as criteria of generic differentiation, consistency should be the test brought constantly to bear.

The great variation in the apparent generic relationships for a long time gave me infinite trouble. It seemed impossible to make any decision which was not based on personal bias; to prevent aught but a tentative re-shuffling of the groups. I felt that certain so-called genera were heterogeneous, and yet could find no character of separation which an English or French or German ornithologist would probably accept as logical. At last I went outside the birds themselves, and utilized a factor even more novel than the tail moult character of the subfamilies. This is geographic distribution, and I found that the purposes of taxonomy were consistently fulfilled by refusing to include, in any single genus, species whose ranges coincided or overlapped. The results were not startling, but the rearrangement showed a conservative breaking-up or coalescing of certain genera whose status had long been in dispute.

Any definite genealogical tree has been absolutely impossible in the light of past knowledge or from the more thorough research which I could bring to bear. From osteological to plumage characters all show such variation that any gradual transition from genus to genus seems hopeless. Evolution, as I have already said, appears to have been radial, and in every species the most generalized characters are found intermingled with those of the utmost specialization. Like the human brain correlated with a pentadactyl hand and foot, we find extremes in almost every species of pheasant.

This condition of things bears directly upon a phase of evolution which has been almost neglected and yet which may ultimately prove to be one of the most important aspects of the subject. This is the inter-relation of factors within the individual species, which I shall only mention here. When we are perturbed over the comparative status, either higher or lower, of any pheasant, let us remember that it is an organism composed of a vast number of characters, of varying importance, each of which is evolving, either degenerating, holding its own or becoming more specialized. And our confusion over correctly orienting the bird as a species is explainable when we realize that of this vast number of characters, all are evolving in their particular manner, perhaps by continuous variation, by mutation, or by some method of which we as yet know nothing. In pondering problems of evolution, it seems to me that we shall arrive at fundamental conclusions sooner by thinking less of our subject as such-and-such a pheasant, either specifically or sub-specifically related to some other one, than if we consider it, more abstractly, as an organism, composed of a vast, intricately related plexus of characters.

KEY TO THE GENERA OF PHEASANTS

Family PHASIANIDAE

Subfamily PERDICINAE *

- Tail moult centrifugal.
  - Tail of 14 feathers . . . *Ithagenes.*
  - Tail of 18 feathers . . . *Tragopan.*

Subfamily PHASIANINAE

- Tail moult centripetal.
  - Tail not compressed.
    - Tail slightly rounded . . . *Lophophorus.*
    - Tail strongly graduated.
      - Both sexes crested.
        - Tail of 16 feathers . . . *Pucrasia.*
        - Tail of 18 feathers . . . *Catreus.*
      - No crests present.
        - ♂s with normal rumps; ♀s dominantly rufous on lateral rectrices . . . *Syrmaticus.*
        - ♂s with disintegrated rump plumage; ♀s not dominantly rufous on lateral rectrices . *Phasianus.*
  - Tail compressed.
    - Rectrices long and narrow . . . *Chrysolophus.*
    - Rectrices short and broad.
      - Rectrices fewer than 18.
        - A fleshy comb present . . . *Gallus.*
        - No fleshy comb present.
          - Rectrices 14 in number . . . *Acomus.*
          - Rectrices 16 in number.
            - Facial area red; feathery crests, ♀s with mantle not chestnut . . . *Gennaeus.*
            - Facial area blue, or, if red, with stalked crest in ♂ and chestnut mantle in ♀ . *Lophura.*
      - Rectrices more than 18.
        - Rectrices from 20 to 24 . . . *Crossoptilon.*
        - Rectrices from 28 to 32 . . . *Lobiophasis.*

Subfamily ARGUSIANINAE

- Tail moult from 3rd pair, outward and inward.
  - Ocellations on both wings and tail.
    - Rectrices 16 . . . *Chalcurus.*
    - Rectrices 20 to 24 . . . *Polyplectron.*
  - Ocellations on the wings alone.
    - Secondaries normal, not longer than primaries . . . *Rheinardius.*
    - Secondaries enormously developed . . . *Argusianus.*

Subfamily PAVONINAE

- Tail moult from the 6th pair, outward . . . *Pavo.*

DISTRIBUTION

At the present day the natural distribution of pheasants is confined to Asia and certain of the East India Islands. They are found from the coast of the Black Sea in the west, to Japan in the east. A line extending eastward from the northerly shores of the Caspian, the Aral Sea, Lake Balkash and north-eastern Manchuria delimits their northern haunts. Throughout most of Persia, Afghanistan, Mongolia, and all except eastern Tibet, pheasants are unknown; while they are generally distributed throughout Korea, Japan, India, Ceylon, China, Manchuria, Burma, Siam, Indo-China, the Malay Peninsula, Sumatra, Borneo, Palawan, Java, Bali, Lombok, Sumbana and Flores. This corresponds very closely with the primary faunal division of the Oriental Region, southward to Wallace's Line. On the north, however, the pheasants extend over the south Asiatic portion of the Palaearctic Region.

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* This key does not cover the Perdicinae groups which are not included in this work.

In the Himalayas the Blood Partridge has been observed at an altitude of sixteen thousand feet, over three miles above the level of the sea, while in Java I have seen Junglefowl feeding in tidal pools at the very edge of the breakers. Unlike members of the Perdicinae, such as the common quail of the Old World, which migrates from Europe to Africa each autumn, pheasants are in no sense birds of passage. As a rule, they are not even great wanderers, exceptions being the Silver and Reeves, which occasionally disappear from an entire district for a year or more, temporarily changing their nesting as well as their feeding haunts. In the north there is a well-marked seasonal migration due to the advance of the deep snows of winter. In the tropical zone of distribution more or less regular seasonal movements occur and may be caused by either of two reasons, the first of which is the fruiting of certain trees providing a local abundance of food, to which the pheasants of the surrounding country flock in large numbers. An excellent example is the Ceylon Junglefowl, which shifts into the hills in great numbers when the nilloo berries ripen. A second stimulus to changing ground is the breeding season, when the birds leave their more open haunts and those near villages and native fields, and betake themselves to the deepest part of the jungle to make their nests. In the tropical species a regular diurnal movement is very general, due to temperature, the birds feeding morning and evening more or less in the open, and retiring to the dense shelter of shady undergrowth to spend the heat of the day.

The irregularity of distribution of the Blood Partridges (*Ithagenes*) is doubtless the result of two causes, first apparently because of our superficial knowledge of the fauna of the interior of Asia, and actually because of the extremely high elevation at which these birds live. From the higher ranges of eastern Nepal these birds extend through south-eastern Tibet, dipping a little way south into Yunnan. They have found lodgment on an isolated mountain peak in south-central Szechuan. Then, north-eastward, we find another form of these sturdy creatures braving the rigours of the Nan-shan and Ala-shan Mountains in Kansu and Shensi.

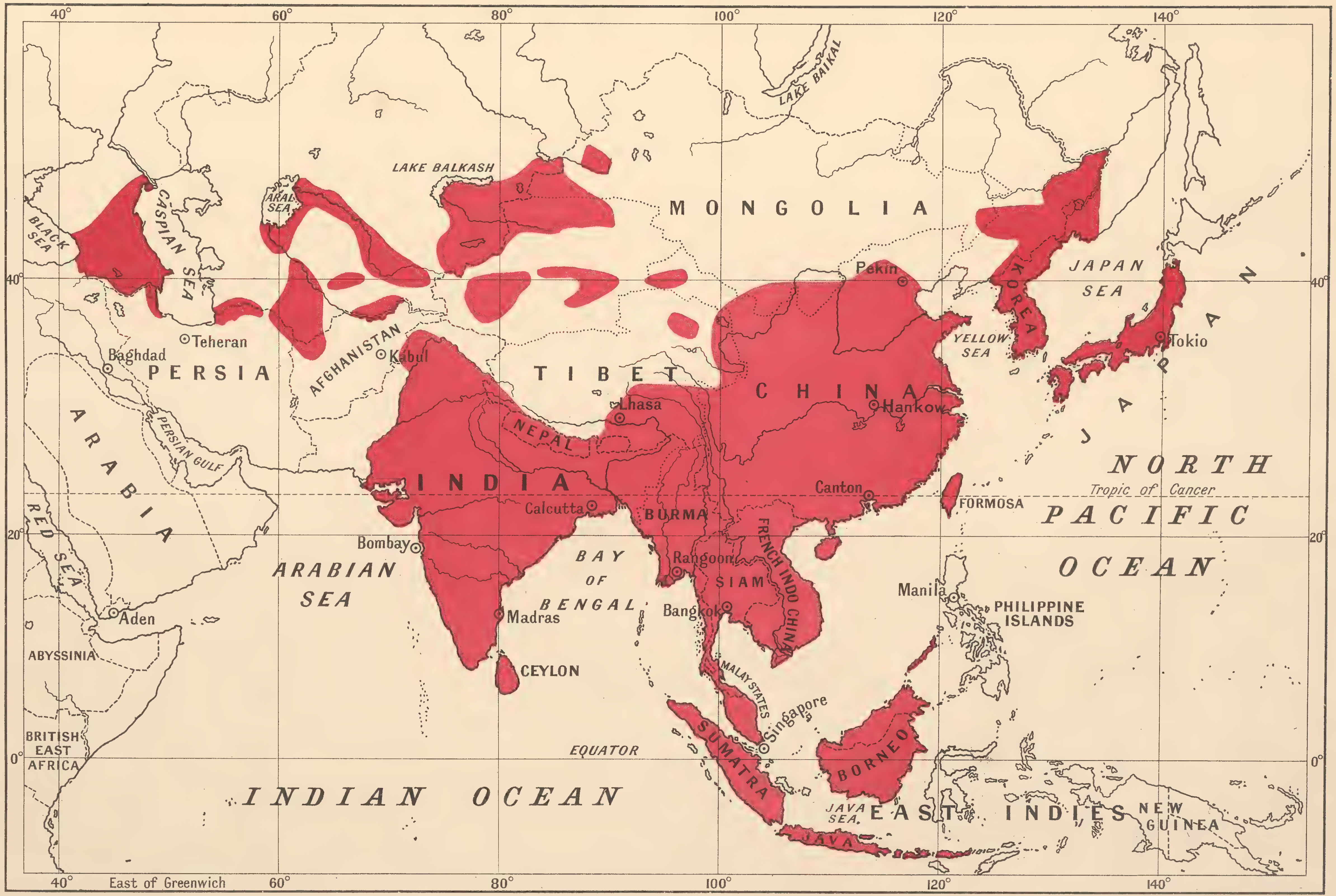
The Tragopans (*Tragopan*) are another mountain-loving group, and their distribution corresponds quite closely to the chief ranges of Asia. One species, however, has made its way well over Assam, and another occupies an indefinitely known territory in south-central China, ranging over rather low mountains.

The resplendent Monals or Impeyans (*Lophophorus*) form a third essentially Palaearctic genus, more conservatively Himalayan than either of the two preceding, but, in general outlines, recalling the distribution of both.

The Eared-Pheasants (*Crossoptilon*) are, perhaps, the most northerly of all. Their southern limits are the banks of the Yangtze in Yunnan, and from here they range northward between Tibet and China, and north-eastward to beyond Pekin.

The following four genera are undoubtedly inter-related, and it is interesting to keep this in mind in considering their distribution. The great group of Kaleege and Silver Pheasants (*Gennaeus*) are intermediate in their haunts, living neither at very high elevations nor often descending to the low plains. They are decidedly pheasants of the hills, or of the foot-hills of the greater ranges. We find them along the entire Himalayan terai, throughout Assam, Burma and southern China. They have

MAP I.


40°
60°
80°
100°
120°
140°
BLACK SEA
CASPIAN SEA
ARAL SEA
LAKE BALKASH
LAKE BAIKAL
MONGOLIA
Pekin
JAPAN SEA
KOREA
YELLOW SEA
JAPAN
Tokio
Teheran
Baghdad
PERSIA
AFGHANISTAN
Kabul
TIBET
Lhasa
CHINA
Hankow
ARABIA
PERSIAN GULF
NEPAL
INDIA
NORTH
Tropic of Cancer
PACIFIC
OCEAN
FORMOSA
Canton
Calcutta
BURMA
RED SEA
Bombay
ARABIAN SEA
BAY OF BENGAL
Rangoon
SIAM
FRENCH INDO CHINA
Manila
PHILIPPINE ISLANDS
Aden
Madras
Bangkok
ABYSSINIA
CEYLON
MALAY STATES
Singapore
BRITISH EAST AFRICA
EQUATOR
SUMATRA
BORNEO
0°
20°
INDIAN OCEAN
JAVA SEA
EAST INDIES
NEW GUINEA
JAVA
East of Greenwich

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MAP SHOWING THE DISTRIBUTION OF THE PHASIANINÆ.

established themselves in Formosa, Hainan, and in central Indo-China. They are essentially birds of a temperate climate, and in Siam and Tenasserim they give place to their truly tropical relatives, the Crested Firebacks (*Lophura*). These brilliant pheasants occupy the western part of the Malay Peninsula and the eastern half of Sumatra and almost all of Borneo. Paralleling them in the Malayan and Sumatran distribution are the Crestless Firebacks (*Acomus*), which in Borneo, however, are found only in the coastal region of Sarawak. The superlatively specialized member of this super-genus is the White-tailed Wattled Pheasant (*Lobiophasis*) of central Borneo.

From this extremely localized species we reach the opposite extreme in the Junglefowl (*Gallus*), birds of comparatively low open jungles. These birds range over Ceylon, south and central India, the Himalayan terai, Assam, Burma and throughout all the countries to the southward, on into Sumatra and Java with its string of lesser islands to the eastward.

The distribution of the isolated group of Koklass Pheasants (*Pucrasia*) recalls that of the Tragopans, in the mountains of the north, with unaccountable gaps which must formerly at least have been occupied or traversed.

The Cheer (*Catreus*) calls the western Himalayas its home, and is almost surrounded by the wide-ranging True Pheasants (*Phasianus*). In a host of confusingly intergraded forms these range from the shores of the Black Sea in the Caucasus eastward through northern Persia, Turkestan and throughout China into Korea and Manchuria. Japan and Formosa are their island homes, and to the south-west they dip into eastern Burma.

The gorgeous Long-tailed Pheasants (*Syrmaticus*) are geographically scattered units—Burma, central China, south-eastern China, Japan and Formosa ; as isolated as are the various forms themselves.

The Golden and Amherst Pheasants (*Chrysolophus*) are also isolated geographically and physically, in the mountains of western and central China.

The two groups of Peacock Pheasants show nicely correlated habitats. The rare and less specialized Bronze-tailed birds (*Chalcurus*) are limited to the mountain ranges in the centre of the Malay States and of Sumatra, while the more typical Peacock Pheasants (*Polyplectron*) inhabit eastern Sumatra, the lowlands of the Malay States and northward throughout Indo-China, Siam and Burma as far as the terai of the eastern Himalayas.

The Ocellated Argus (*Rheinardius*) are also the less specialized members of this wonderful type of bird, and our imperfect knowledge of their haunts compels us at present to limit them to central Indo-China and the central mountains of the Malay States. The True Argus (*Argusianus*) extends over all the Malay Peninsula, eastern Sumatra, and Borneo except along the coast.

The Peafowl (*Pavo*) are wide-ranging, covering all India and Ceylon, Assam, Burma, Siam, Indo-China and the Malay Peninsula. Sumatra, by some strange freak of dispersal, is uninhabited, but in Java, lying many miles to the south, the birds are numerous.

Reviewing the distribution of the pheasants as a whole, we find that the nineteen genera group themselves as follows :—

PALAEARCTIC REGION

MANCHURIAN SUB-REGION—
- *Ithagenes*
- *Tragopan*
- *Lophophorus*
- *Crossoptilon*
- *Pucrasia*
- *Catreus*
- *Phasianus* (also in Siberian sub-region and in northern Oriental region)
- *Syrmaticus* (also in northern Oriental region)
- *Chrysolophus*

ORIENTAL REGION—
- *Gennaeus*
- *Acomus*
- *Lophura*
- *Lobiophasis*
- *Gallus*
- *Chalcurus*
- *Polyplectron*
- *Rheinardius*
- *Argusianus*
- *Pavo*

Phasianus and *Syrmaticus*, while extending into the northern part of the Oriental region, are unquestionably of true Palaearctic origin. With the exception of the wide-ranging *Phasianus*, all the eight genera are typical of the Manchurian sub-region. In regard to the Oriental region, it seems impossible to recognize the divisions into Indo-Chinese and Indo-Malayan sub-regions. *Gennaeus* is the only genus confined to the former, and *Acomus* and *Chalcurus* alone are limited to the latter. All the remaining groups are found in both of these sub-regions. *Gallus* and *Pavo* are the only genera of Pheasants which enter the Indian and Ceylonese sub-regions.

The genera of pheasants under consideration almost without exception support the finer zoogeographical divisions of Wallace rather than those of Lydekker or Sclater.

I have already indicated the importance which I attribute to geographical distribution in the demarcation of genera. In such a case as the removal of the Reeves Pheasant from *Phasianus* and in other instances, such a criterion seems fully in agreement with physical characters of differentiation.

The correlation between distribution and the three subfamilies of true pheasants tends to strengthen these divisions :—

PHASIANINAE	Palaearctic Region	*Lophophorus* *Crossoptilon* *Pucrasia* *Catreus* *Phasianus* *Syrmaticus* *Chrysolophus*
	Oriental Region	*Gennaeus* *Acomus* *Lophura* *Lobiophasis* *Gallus*
ARGUSIANINAE	Oriental region	*Chalcurus* *Polyplectron* *Rheinardius* *Argusianus*
PAVONINAE	Oriental region	*Pavo*

Summing up the general distribution, there seems little doubt but that the pheasants are essentially northern in origin, and mountainous rather than low-living. Progression southward in every instance, both specifically as well as generically, is correlated with increasing specialization, and consequently we may assume that it also indicates a lengthening of the distance from the place of origin. In the three subfamilies of typical pheasants we find seven genera which are quite northern, practically confined to the Palaearctic region. The remaining ten are found in the Oriental region. It is among these that we find the surest proof of the northern or mountainous origin. The supergenus group, commencing with the rather generalized *Gennaeus*, frays out southward into more and more specialized forms—*Lophura*, *Acomus* and *Lobiophasis*. *Gallus* has the most generalized species, *gallus* in the north, and the highly modified *varius* far to the south in Java. The same applies to the Peafowl. In the cases of the Peacock Pheasants and Argus, the least specialized forms, *Chalcurus* and *Rheinardius*, are wholly mountain loving, while *Polyplectron* and *Argusianus* live nearer sea-level.

COMPARATIVE ABUNDANCE

Only in the case of Peafowl in India, in places where the birds are held sacred, and in the rice-field pheasants of isolated parts of China, can any member of the pheasants be said to be really abundant. Enemies are too numerous, and birds of such considerable size too conspicuous to be able to maintain themselves in great numbers in any locality. Yet in parts of the Himalayas far removed from mankind I have sometimes seen five species and several dozen individuals in the course of a day's tramp. And the sound of a gun would often enable one to locate (vocally and, of course, temporarily) every cock pheasant within earshot.

The comparative sociability gave me, at certain seasons, fairly accurate data to estimate the pheasant population of circumscribed districts. The Argus seems the most unsociable of all his kindred. For month after month the birds wander through the jungle or keep their dancing grounds in order, associating with none of their kind, perhaps never even seeing another Argus until the breeding season, and then only a solitary rival cock or two to vanquish in combat, or a hen attracted by the loud nocturnal calling. It would seem as if some of the Kaleege must fairly breed in colonies, so fond are they of one another's company. I have seen them day after day feeding, wandering about and roosting in large flocks. The regularity of movement of these flocks makes it an easy matter to form a comparatively accurate census of any single locality. After the breeding season, pheasants in a wild state are quite tolerant of one another, but even when in flocks there seems to be a pretty definite recognition of caste, might always being right. A rough classification of pheasants based on their general sociability results in something like the following table—

SOLITARY	IN PAIRS	GREGARIOUS
Lobiophasis	*Tragopan*	*Ithagenes*
Chalcurus	*Gallus*	*Lophophorus*
Polyplectron	*Pucrasia*	*Crossoptilon*
Rheinardius	*Catreus*	*Gennaeus*
Argus	*Syrmaticus*	*Acomus*
	Chrysolophus	*Lophura*
		Phasianus
		Pavo

This indicates merely that those in the first column are seen more often singly—both males and females—than in company with others of their kind; those in the second column are usually observed in pairs or trios, while one's dominant memory of the eight genera listed as gregarious is of birds in flocks. It is interesting to note that the more jungle-loving, tropical pheasants, including all the members of two sub-families, are essentially solitary. This is due, perhaps, to the multiplicity of terrestrial enemies and the difficulty which a flock of birds would have in escaping any sudden onslaught in the dense undergrowth.

VOICE

Pheasants have been generously endowed in the matter of voice, and, indeed, in their life economy the sense of hearing is second in importance only to that of sight. The gamut in feeling is great; that of latitude no less. The loud crow of chanticleer has gathered strength under the protection of mankind, and follows daylight around the earth wherever mankind has made a home. The nocturnal challenge of the Ocellated Argus has been heard by perhaps a scant half dozen white men, and only on a few isolated *bukits* of the Malayan range. Mingled with the roar of the avalanches which crash down from the Himalayan glaciers, we may hear the *seep! seep!* of the Blood Partridge and the louder call of the Impeyan. In the warm wind blowing from the sea off the Javan coast comes the regular boom of breakers and the high, broken crow of the Green Junglefowl.

To the sportsman or field naturalist in search of creatures other than pheasants, the chief vocal memory of these birds must always be the shrill cackle of terror which so often accompanies sudden alarm and headlong flight. Using still-hunting and tent observation as my methods of study, I was able to enter more intimately into the life of these birds and listen to their more composed small-talk. The varied utterances of the barnyard fowl are well known, and, with the exception of the more solitary inclined species of wild pheasants, I feel certain that all have an equally varied vocabulary. Whether watching the birds from my umbrella tent or an ambush among the branches, or observing those in pheasant aviaries, this correlation between natural social instincts and volubility invariably holds good. A pen full of Peacock Pheasants is usually silent; a flock of Silvers keeps up a running comment audible many yards away. So deeply implanted is this trait that these latter birds talk to themselves when quite alone. In a cage I have seen a Kaleege contentedly murmuring to himself by the hour, and in some isolated patch of jungle I have watched one of the same group scratching vigorously for his own delectation, and unintermittently voicing his pleasure or impatience at the results.

In the life-histories of the various species I have entered into details which I shall not repeat here. Briefly, we may recognize several general divisions of utterances. First in importance is the crow of the cock, which may be both a challenge to rivals and a call to females within earshot. Then there is the alarm note, often uttered by both sexes—by a cock to his harem, or by a hen to her brood. With modifications this may serve to express a considerable variety of emotions; when less vigorous it may indicate suspicion, and when agonizingly increased becomes the scream or cackle of terror. As the vocal antithesis of this we have in many of the social species the content note, which is given under many conditions, but only when the birds feel quite safe, whether feeding, wandering slowly about, or preparing to roost. The call note is very unlike any of the others, and is heard only among gregarious pheasants, and chiefly when a flock has been scattered and is collecting again. The call to safety of a hen to her brood is a very gentle form of the alarm note, repeated rapidly. Occasionally in captivity, and rarely in a wild state, I have heard the most pleasing of all their utterances. The evening song of the pheasant is an elaborate variation of the content song, uttered from the branch to which the bird has flown to roost for the night, but before it has settled down. A Tragopan, a Golden, two Kaleege and a Ring-necked Pheasant have thus sung to me, and these experiences are among the most memorable in my study of the birds.

An entire chapter might be written on the crows and challenges of pheasants. Like most of the activities of these birds, the crowing takes place chiefly at daylight and dusk, especially in the tropics. In the mountains desultory challenging may go on all day. The call of the Tragopan is more like the mournful wail of the Panda than the utterance of a bird. The broken crow of the wild red Junglefowl differs not at all from that of a bantam, while the varied calls of the other three species are a vocal protest against their being considered in the line of descent of our domestic fowl. The isolated character of *Pucrasia* is enhanced by the individuality of their crow, which gives rise to their onomatopoetic name, Koklass. Another reliable character emphasizing the close relationship of the Kaleege, Silvers and Firebacks is their voice. It can neither be written nor adequately imitated by the human larynx. There comes to the ear a low guttural mumbling or rumbling, breaking suddenly into an abrupt, long-drawn-out, staccato, liquid gurgle. The four genera in this group, ranging from the White-crested Kaleege in Kashmir to the White-tailed Bornean bird, all have this peculiar mode of expression. It has so often come to my ears as the climax of many hours of concentrated watching, that I can never hear it without profound emotion. Next to the cosmopolitan crowing of the domestic cock, the voice of the so-called English Pheasant is, perhaps, most widely known. Whether heard on the uplands of England, on the steppes of the Caucasus, among the rice-fields of Japan, or in our own American fields, the sudden broken, trisyllabic note can never be mistaken.

It is difficult to overestimate the importance which the voice of these birds plays in their lives. With many it is so potent that its imitation, even clumsily achieved, offers the easiest method of enticing them within gunshot. To the Argus more than to any other, the call for a mate must be of vital importance, for not only does it call in the night, from the depths of a tangled jungle, but, as we shall see, it is localized, bound to one spot by the exigencies of its habits of life, so that without the constant, far-reaching announcement of its presence and needs, the race must become extinct in one generation. But the crowning mystery of these wonderful aerial vibrations, upon which the very existence of the race of Argus depends, is the avoidance of the enemies to whom the loud call must be as significant as it is to a rival cock or an expectant hen. Fraught with all the deepest meaning of animal life as it must be to the latter, we, with our human ears, can never call the crow of a pheasant a sweet sound. The law of compensation operates here as elsewhere, and the difference between a Peacock's plumage and its voice has become proverbial. A more raucous, penetrating sound would be hard to imagine, yet it is perfectly adapted to its function in the wild life of the bird.

The gregarious nature of pheasants has brought into play another method of communication, not vocal but mechanical. This is the wing drumming. In no pheasant is this aeolian language so highly developed as in our ruffed grouse, where the alar reverberations almost usurp the voice in challenge and mating call. In several groups of pheasants are found brief, unskilful wing beating or rather clapping, as in the Junglefowl, given usually just before or after crowing. The best-known instance is the domestic cock, who claps his wings smartly together over his back before uttering his rather perfunctory crow. In the True Pheasants this clapping gives place to a whirring, and in the Kaleege and Silvers is found the highest development of this method of communication. At the breeding season the cocks challenge and also summon the females by a series of loud, deep reverberations, produced by vibrating the wings with great rapidity throughout the narrow arc of a circle, the bird standing erect, the wings half raised and half extended. But even after the period of nesting has begun, this wing whirring does not cease, and in fact is continued throughout the year. By means of it the birds are able to express many emotions and even shades of feeling, to convey suspicion, warning, fear, to summon their family or call together the scattered covey. It is a sound which in volume suggests some large and dangerous creature, and it doubtless benefits the timorous authors proportionately, intimidating invisible enemies as well as communicating warning or welcome to birds of their own species within earshot. On the other hand, when the sound is imitated by a bit of whirling palm-leaf or a handkerchief in the hollow of a man's hand, it becomes a fatal siren, luring the pugnacious or amorous cock to destruction. Every hue, every pattern, every habit, every character in these birds is often a two-edged sword, cutting toward both life and death.

FLIGHT AND GAIT

The pheasant wing is much like that of the quail or grouse, short and rounded, built for the quick, rapid beats which carry the bird with a rush, out of immediate danger. The subsequent flight is of less importance. In thick jungle it usually ends in a tree close at hand. In the open, the chances are that the birds are flushed from a mountain or hillside, and when once clear of all obstruction the bowed wings are set and the pheasant scales swiftly downward. When the alarm is thorough, the bird will occasionally continue the rapid beating and make its way on a more or less even line straight across the valley. Usually the bird or the flock drops to the ground a few hundred yards away and continues its course on foot.

A Reeves Pheasant has been said to make a single flight of several miles on some of the large preserves—the longest record for any pheasant of which I know. I have seen a Peacock with full-grown train rise from tall grass and fly steadily for the third of a mile, never losing altitude and finally alighting near the summit of a dead tree, some seventy feet from the ground. Unless forced to do so, pheasants prefer to escape on foot, and some species I have never been able to flush, even with the aid of a dog.

While Cheer Pheasants are, perhaps, among the weakest fliers of their family, they can probably attain the greatest speed. No other pheasants that I have observed seem to hold the wings closer to their bodies while shooting down a steep hillside.

They launch out with a few rapid wing beats and then drop like meteors, at the last moment breaking their impetus with widespread wings, or turning like a flash to left or right with a mighty sweep of the tail-feathers.

The gait of pheasants is usually slow and dignified. The neatness with which a Golden or Silver will pick its way over rough ground is delightful to watch. An Impeyan with its short legs and thickset body is probably the least attractive when in motion. But the need for constant alertness and the frequent stops in order to look and listen, give to almost all pheasants a carriage which is the embodiment of grace and poise.

DAILY ROUND OF LIFE

FOOD

Looking back upon many intimate memories of pheasants busily feeding, and upon scores of stomachs which I have carefully examined, one item of diet dominates all others. Wherever termites or white ants occur, there they will be sought diligently by pheasants. I have counted hundreds of these insects with additional quantities of eggs and pupae in the crop of one bird, so the total consumption must be enormous. This applies, of course, to pheasants in more tropical regions where termites abound. In the north, as among the Himalayan ranges, the chosen food wherever available is berries, such as those of the juniper, and the leaves of shrubby plants. Pheasants on the whole, however, are decidedly omnivorous, and few edible objects, whether vegetable or animal, come amiss to them. In the Himalayas, when certain flowers are in bloom, the birds eat quantities of the petals.

Every important order of insect is taken without hesitation, and it is remarkable what spiny creatures are swallowed whole without apparent damage to the mucous membrane. Pheasants have unusually keen vision, and among the less injured types of insects I found a certain percentage of what might be considered protectively coloured ones. Twice only were the wings of butterflies distinguishable, an orange and yellow *Ixias* of medium size in one case, and again a hindwing of the giant black spotted jungle butterfly *Hestia*. There is no doubt whatever in my mind that both protective coloration and mimicry are very potent agencies in preserving members of this order from destruction, the first factor operating when the insect is at rest, and the second when the birds have learned their bitter lesson. Again and again while safely cached and watching pheasants, I have seen conspicuously marked butterflies flap slowly about within easy reach, observed but undisturbed by the birds. Three times I saw half-hearted attempts made to seize butterflies; once a short chase after a Kallima-like individual as it snapped past, and the other two efforts, equally unsuccessful, made upon more brilliant insects.

In Garhwal, about mid-May, small moths were exceedingly abundant among the underbrush, and I found several species of pheasants feeding largely upon them. I recall taking thirty-eight from the crop of one Kaleege.

Impeyans, Cheer and Kaleege are great diggers. The first-mentioned work systematically in flocks, and like a little company of sappers and miners, excavate deep holes in the turf of the high mountain meadows. As these hollows are extended they coalesce, and soon a large area looks as if it had been deeply ploughed. While grubs and worms are all taken, yet the main object of search seems to be coarse tubers which are broken up and swallowed. Strange to say, all this work is done with the stout, curved beak, the upper mandible of which overhangs and is effectively used with a pick-like motion.

In the tropics I found Firebacks and others scratching among the shallows and pebbles of jungle brooks, devouring earwigs and small crayfishes. Still more remarkable in habit were the Green Junglefowl on the sea-shore in Java, feeding on shrimps and marine worms from the small coral pools left by the tide. In several instances I obtained recognizably new species of insects from the crops of birds, and from pheasants such as the Argus, numbers of strange seeds of trees or shrubs wholly unknown to botanists. So attractive are certain kinds of food, berries or small fruits, that their annual ripening is sufficient to attract birds from many miles, and from low plains to considerable elevations. At such times the birds eat ravenously and become fat and unwieldy, and larger numbers fall a prey to jungle cats and other animals than when they are in better condition.

Early morning and evening are the usual feeding times. In the mountains and in the more northern haunts, however, this habit is less rigorously observed, both because the midday heat is not oppressive, and because a greater amount of calorific nourishment is necessary.

ROOSTS

I was able to watch a number of species of pheasants returning nightly to their roosts, and in many more cases I found undoubted roosting places. Intensive search of these localities would almost always reveal stray feathers which afforded certain identification, while the position and amount of sign yielded data as to the location of the roosting branch and the length of time the place had been in use. Wherever possible, pheasants of all species roost in trees, usually about midway to the summit, and well out from the trunk, by preference selecting a tree devoid of branches for some distance from the ground. This situation appears to be the one best suited for the avoidance of nocturnal enemies. While still sheltered from passing owls by overhanging foliage, yet the distance from the trunk enables the birds to be forewarned of scansorial enemies by the shaking of the branch. A hen may sleep close to her nearly grown brood, but usually the birds roost separately, although as many as six or eight may occupy the same tree. A prevailing wind always determines the direction which the birds face. If undisturbed the birds return to the identical spot night after night, while well-chosen roosts may be occupied for many months.

Red Junglefowl sometimes offer a startling exception to the non-gregarious roosting habit. As many as thirty cocks and hens have been observed roosting close together on the slanting stem of one giant bamboo. To all intents and purposes these were wild birds, yet I accredit this phenomenon to the infusion of blood from some village fowl, breaking down the more feral, solitary, roosting instinct.

The going to roost is no hasty matter, but one to be gone about with circumspection. The birds gather slowly and by devious routes, and there is much hesitation and small-talk before the first upward leap or flight is essayed. When the final branch is reached there ensues much half-hearted preening of feathers, the song is perhaps given, with long stares at the surrounding jungle, or upward at the dying light in the sky. Finally the birds settle down, and sleep with the head tucked behind a wing. I have watched birds sleeping quietly, their rounded forms silhouetted against the moon, and crept quietly back to camp, leaving them at rest. And, again, I have seen a pine marten send down a pair of Kaleege, screaming with terror as they fluttered blindly out into the darkness. I think, however, that but few dangers come to these birds while they are roosting. Their bodies give forth no tell-tale scent, and the roost is chosen with utmost care. Peacocks differ from other pheasants in that they seem not to fear the onslaught of owls. Their invariable rule is to choose a very lofty dead tree, and to spend their nights singly or as many as seven together, far above the surrounding jungle, insulated from terrestrial enemies by the unclimbable, smooth, hard bole of the weathered forest giant. Junglefowl inhabiting semi-arid regions make their way to the centre of some thorn-bush for protection. The Cheer appear to be the least arboreal in their roosting habits, and I found them in widely separate places spending the night on steep hillsides, under the shelter of turf or of some outjutting boulder. The most unusual roosting sites which I observed were in Nepal and Java. On a Nepalese hillside three Impeyans used a niche on a gigantic boulder, well out of the way of roving foxes; in Java a family of Green Junglefowl sought shelter every night deep within a coralline cave on the summit of a ridge, perching on the jagged limestone far beneath the surface of the ground.

FRIENDS AND ENEMIES

No one will deny to pheasants the possession of enemies, and could we know more of the dangers which await them on every hand, and the tragedies which overcome scores of their number every day in the year, the list of foes would be a long one. At first thought the count of their friends would seem to be confined to their mates and broods, to all Buddhists, and to gentle Christians like St. Francis. But without giving the word friendship a broader meaning than it often holds among mankind, pheasants may be said to have real friends among the wild kindred, even though we must admit that the bonds are those of fear and hunger.

One of the commonest sights in the Far East is the constant association of cattle egrets with water buffalo. The appearance of the great blue-black beasts is almost always synchronous with a flock of the white herons. To a less universal extent we find similar conditions among many of the pheasants. In northern Burma, when one is hidden in a blind of bush on a hillside, and there come to the ear the chuckling gurgles of a band of laughing thrushes, the chances are ten to one that, following closely in the rear, is a flock of pheasants. The relation here, as elsewhere, is reciprocal. The pheasants are on their usual afternoon trip down to water, feeding casually as they go. The babblers join them, and benefit by the multitude of flying insects which are disturbed by the scratching pheasants, and which are seized in mid-air or after they alight. Keeping as they do to the shrubs and low branches, the babblers have a much wider outlook than the terrestrial pheasants, and are able to detect danger at a greater distance. Scores of times my most careful stalks, or quite perfectly concealed shelters were rendered useless by the sharp eyes of the smaller birds. At a single alarm note, the entire flock set up such a shrieking, cachinnatory chorus that the pheasants departed at once, and every jungle creature within earshot was put on guard. All pheasants recognize and act upon the sudden alarm note of a bird, no matter what the species. This is a language which the whole jungle understands. But this intimacy between smaller alert birds with vocabularies as extensive and powerful as they are significant, in some localities makes it almost impossible to approach or observe pheasants, which by themselves are not especially wary. The Tragopans, because of their semi-arboreal habits, need such aid less than pheasants of other groups. Besides the Kaleege and Silver Pheasants, the Koklass and Junglefowl benefit from the watchfulness of babblers, and I have seen Malayan Peacock Pheasants warned by attendant laughing thrushes. In Burma, the black-gorgeted and the black-throated thrushes are the species which are constantly associated with the Kaleege. These pheasants seem to be particularly fortunate in this matter of wild friendships, for they are often seen with the small musk deer, the two creatures keeping together for hours at a time. Eared-Pheasants in the north, and the White-tailed Pheasants in Borneo, have also found these deer good companions. In this instance it is unquestionably a case of sense reciprocation. Both contribute equally in the matter of acute hearing, but the pheasants supply by far the keener eyesight, while to the deer every scent is significant of safety or danger. Assailants, invisible to the birds, must often be foiled by the stamping signal of the tiny deer, which sends both in headlong flight.

At the present day, man is the pheasants' worst enemy, and through no sense of retribution, for these birds do no appreciable damage to crops in any part of the East. But this danger is a matter of the last few years, and although this must inevitably be the ultimate factor of extermination, it has had nothing to do with their evolution or past life. In my searches for the birds month after month, I came, now and then, upon direct evidences of tragedy, and in the monographs of the various species I have given all the knowledge at my command on this subject. In the more northern parts of their range, the leopards, lynx, jungle cats, foxes, wild dogs, martens and weasels take heavy toll, the martens being perhaps the most dreaded. The larger owls, hawk-eagles and the golden eagle are the principal foes of the air. I have known one of the latter birds to strike down a cock Impeyan and a panda or cat-bear in quick succession. In the Himalayas the chief enemies of pheasant eggs are bears, monkeys, crows and snakes. As if this were not enough, the elements contribute their share of danger, and an occasional downpour of great hailstones smashes every unprotected shell, and is often severe enough to kill the sitting hen. In the tropics there is hardly a carnivore or bird-of-prey of any size which does not contribute to the tragedies of the pheasants. Civet cats, jungle hawks and serpents, doubtless stand at the head of the list of tropical enemies.

PROTECTIVE COLOURING

In the matter of the struggle for success in life the pheasants are heavily handicapped. On the one hand, they are birds of large size, edible to all flesh-eating creatures, weak-winged, practically devoid of the sense of smell, and often spending their lives where dense underbrush allows an enemy to lie in wait unperceived. Their assets are mainly two, sight and hearing. These are developed to the highest degree of efficiency, and form an aerial zone of safety within which foes only of endless patience in waiting, of superb skill in stalking, or fitted for nocturnal hunting can hope to penetrate.

Pheasants are brave, and remarkably pugnacious, but their use of beak and spur is confined chiefly to contests with rivals of their own species. The hens, with their broods, usually trust to flight and instant dispersal on the part of the young birds, although the Junglefowl are said, like the grouse, sometimes to simulate a broken wing. But with pheasants discretion is the surest solution of safety, and, as I have said, their wing-power is wholly adapted for quick, instantaneous reaction to attack. But it is probable that, even without flight, many species could maintain themselves because of the great development of running powers. The tropical forms almost never take to wing, and I have even seen them make their way, leap by leap, up to some lofty perch without ever raising wing from body. Even the better fliers add immeasurably to the chances of escape by running swiftly after they have alighted in some distant thicket. The birds show considerable discretion in the use of their powers. When attacked by foxes or, unfortunately for them, by the dogs of sportsmen, they know better than to risk a cursorial match with these fleet-footed creatures, and fly at once into the nearest tree to wait until the animals leave. Under normal feral conditions this is a perfect defence, but men and shot-guns are too recent injections into their cosmos to have taught them that it means, in the case of dogs, certain death. When slower-footed foes attack, the more sombrely coloured birds squat, or else escape is made on foot at a pace which, in actual speed, as well as sharp turns and doubles, makes pursuit useless. The longest of tails or trains seem to offer no hindrance at such a time.

These are the defences which the pheasants offer to enemies after they are threatened or attacked. To keep from being perceived by foes keen of ear and eye is an important part of their lives. When moving about, their slow, high-stepping gait is well adapted to silent progression, and I have seen a flock of large pheasants pass close to me without the least sound to indicate their movement. In this phase of defence, too, the birds have learned to gauge the chances, and they will often scratch loudly among the dead leaves of a forest, trusting to frequent listening to warn them of the approach of danger.

The avoidance of being seen by enemies is the most interesting phase of this whole subject, and, under the general heading of protective coloration, has been discussed and argued of late by both field and museum naturalists, artists and sportsmen. This discussion, much of it futile, some of it intensely significant, has accomplished one very excellent thing, besides stimulating general interest in the meaning of colour in nature. It has shown that the satisfactory solution of any problem presented, either by technical science or the life histories of wild creatures, must be backed by an explanation capable of logical and philosophical proof. Then, and then only, will it be accepted as truth by all who are interested in the discussion. This will do away with sweeping generalizations, and it will necessitate the testing of each case separately.

A concrete example of the hopelessness of any compromise occurred recently to me. The question was whether the full-plumaged Peacock is protectively coloured or not. After living in the haunts of these birds and studying them daily for many weeks I became completely convinced that they were not protectively coloured, and that their sole desire was to detect danger at the earliest possible moment and at once fly up into the tallest dead tree they could find, to command the widest outlook. In the course of one trip along a river I observed over six hundred Peafowl, and without exception this was their method of escape. When I related this to a friend who upheld the universal protective idea, his answer was, "Think of the six *thousand* birds concealed by their plumage which you did not see!" In certain limited areas where I came to know the wanderings and range of the very individuals, I knew I had not overlooked any Peafowl, but I could offer no conclusive proof of this, satisfactory to him.

When I began my study of pheasants in the field I made up my mind to eliminate all theory and *a priori* assumption and to try to form my judgments wholly on the merits of the phenomena which presented themselves. Before I had completed my studies of a single species I perceived an entirely new point of view, and one upon which I have been satisfied to base all my assertions of protective or non-protective colouring. In many of the localities where I studied pheasants at close range the sight of a man was rare or unknown to the birds, and their reaction at his appearance was exactly the same as took place when any danger presented itself. The pheasants' realization of their own degree of protection seems to me an irrefutable solution of the question, regardless of the fact that it must be to them wholly instinctive. I have taken this up in detail under the various species, and shall present here only a brief summary.

I found a very marked difference in reaction to danger, not only specifically, but sexually, and even according to the age and plumage development of one sex. The Impeyan is an excellent example. If, as very seldom happened, one came unexpectedly and at short range upon a flock, the birds all took to wing simultaneously. If the alarm came from a distance, even if this was considerable, the cocks flew at once, while the females crouched for a longer or shorter time according to the degree of danger. This I came to look for in all species where the male was noticeably more brilliant in colouring than the female. The Golden, Amherst, Silver, Kaleege and White-tailed Pheasants all exhibited it. I received additional emphasis as to this relative amount of fear from other than direct ocular evidence. In many parts of Burma where Kaleege were abundant, females appeared to be more numerous than males, and yet the drives which the natives occasionally made resulted in the capture, in snares or dead-falls, of four or five times as many cocks as hens. This was doubtless due to the squatting, slinking escape of the brown hens, lying close until the line of beaters had passed by.

But this was only the most obvious proof which the birds themselves furnished. Not only when I alarmed the Impeyans but when, as I watched from my blind, some animal appeared in the distance and frightened them, I noticed time after time that the half-grown males were intermediate in their reactions. Where several were in the flock, they would squat at first but usually fly soon afterwards, following the more brilliant adult cocks which had already disappeared far down the slope. The brown-tailed *Lobiophasis* cocks in Borneo bore out the same delicate gradations. Government surveyors and geologists in Calcutta, and several officers who were ardent entomologists when off duty, had noticed these facts but without attaching any special significance to them. No sportsman whom I questioned who hunted with dogs had observed anything of the kind, obviously because the instant a dog appears every pheasant, of whatever species or sex, instantly flies up into a tree. Still other facts emphasized the truth of the sex distinction. In the Brown Eared-Pheasants and the Cheer the sexes are very similar, and it is the common experience of hunters who know these birds that both cocks and hens squat or slink quietly away upon the approach of danger. Indeed, so complete is the dependence of Cheer upon their resemblance to the turf of their mountain meadows that when once well alarmed it is almost impossible to flush them without a dog. They will lie close until one's foot is almost upon them. Sportsmen write of knocking them over with a stick and even catching them in the hand, a feat which would be unthinkable in the case of the more brilliant pheasants.

Here we have a test of protection which seems to have no weak spot. There is no question of our considering it with anthropomorphic vision or influencing the birds in any way. Natural selection, or trial and error, or whatever one may wish to call it, has etched into the instinctive actions of the birds, hereditary reactions to danger nicely adjusted and synchronized with the sombreness or brilliancy of the plumage. It seems to me we have here at least taken one step in the right direction of accurately gauging the relative value to the birds of the general sum of their colouring.

In a tropical jungle even brilliantly coloured birds have a better chance of being undetected than in northern forests, but the one secret of this is immobility. I have watched Firebacks at close range and have been impressed with the way their manner of feeding contributed toward this end. They seized the morsels of food with sudden jerks of the head and neck, each peck being followed by a much longer period of immobility. Or if two or three pecks were made at one time, the bird would then straighten up and stand like a statue for a minute or more. Thus the percentage of motion to that of immobility in these birds is very small, and the consequent chances of observation by any enemy coming into view are greatly reduced. Again, intensive watching showed a decided difference in the actions of fully adult and partly grown birds of both sexes, the latter physically distinguishable only by their shorter spurs, but mentally by a very apparent laxness and abstraction. They were on guard only part of the time and apparently still depended on their parents or companions for warning.

Indian Peahens trust to their comparative sombre plumage and are far less wary than cocks, more especially toward four-footed enemies than to man, but I have seen a cock, in very tall grass, stand for a while with head and neck rigid while he watched me in the distance. The resemblance to the crooked sticks which projected here and there was perfect, but he permitted no closer approach. All truly wild Peacocks in jungle or on river banks flew at once and did not stop until they reached some lofty bare perch, where their grass-green bodies and sky-blue necks became a monochrome black silhouetted against the bright clouds.

The great Argus Pheasant, while ever ready to slip away in the opposite direction whenever its keen ears told it of some approaching danger, on occasion behaves in a manner which is the very antithesis of the Peacock. When a troop of gibbons have dashed past overhead and several of their number swung noisily down among the branches close to the ground, in frantic pursuit of one another, I have seen an Argus crouch flat, body, neck and head pressed close to the ground, its mottled plumage and crinkled tail-feathers merging perfectly with the lights and shadows of the forest floor. The Bornean Wattled Pheasant, with its great semicircular fan of blazing white tail-feathers, never attempts to squat, and only a closet naturalist, or one who wilfully blinds himself to the evidence not only of his own, but of the bird's judgment, could ever call such a bird protective in any sense.

HOME LIFE

As with all birds which live in the northern hemisphere, pheasants nest in the spring of the year. In the Himalayas April, May and June are the usual months. As we go toward the tropics the less distinct demarcation of the seasons leads to a spreading out of the nesting period, and in the Malay States and Borneo this extends over more than half the year. The Javan Junglefowl nests from June to November and the Argus from February to August. In captivity the cock Argus sometimes calls from April to September. A species with an extensive range shows corresponding variation from north to south. Peacock Pheasants in the north breed from March to May, while farther south this extends to June. The Red Junglefowl makes its nest from February to May in the terai, March to June in Burma, and February to late August in the Malay States.

In brilliancy of colouring and elaborateness of feather ornaments pheasants are equalled by only one other group, the hummingbirds. Whether or not we believe in the theory of sexual selection, there is no disputing the fact that in almost every case the brilliancy is confined to the male, and the ornamental crests, ruffs, wings, trains, and tails serve only the one function of being displayed for a brief period before one or several females. To add to the complexity of the problem I know of not a single instance of a female showing what may be termed pleasure or even interest in the display! And yet I believe that sexual selection is a very real phenomenon, a very important one in the life of these and other birds.

The detailed discussion of this subject in the monographs of several of the species must suffice, except for a brief résumé. The method of display of the cocks is of considerable interest. This courtship display may be divided into lateral and frontal, and in this category the genera appear as follows—

LATERAL
Crossoptilon
Gennaeus
Acomus
Lophura
Lobiophasis
Gallus
Chrysolophus
Pucrasia
Catreus
Phasianus
Syrmaticus

FRONTAL
Lophophorus
Chalcurus
Polyplectron
Rheinardius
Argusianus
Pavo

In the first division we find all the related groups with compressed, curved tails together with those whose tails are long, slender and straight. In the second line we again find the familiar association of the subfamilies Argusianinae and Pavoninae and the isolated group of Impeyans. This classification is of use in giving us a hint of the most specialized genera. There is no doubt that the frontal display is the latest acquired, the most specialized, for in practising it the cocks invariably begin with the lateral, showing off first one side, then the other, as they approach the hen, and only finally assuming the wonderful frontal posture as a crowning climax.

The Eared-Pheasants are the only ones in which the sexes are identical in colour, although even they are distinguished by the presence of spurs in the male. In the Cheer the cock and hen are rather alike, both being rather generalized in colour. But in all the other pheasants there is a decided brilliancy in the male. Immediately after the breeding season there is a complete moult and all the plumage is renewed, contour, flight and tail feathers, ruffs, ear-plumes, crests and trains. Throughout the winter months, or in the tropics during the dry season, these ornaments are kept more or less concealed, the ruffs and trains are closed tight, the crests shut down, the fiery backs and wonderfully painted wings and tails seldom giving forth a flash of their hidden glories. As spring approaches, the cocks begin to send forth their challenge, either the penetrating crow, or in some cases instrumentally with whirring wings. Shortly after this period courtship begins, one of the most marvellous phases in the life of birds. The object of the cock is to bring to the attention of his prospective mate every brilliant hue and pattern upon his plumage, to make himself appear as large and as blazing an object as possible, to swell out wattles, to rattle the dry quills of feathers, to utter sounds never heard at other times, to shake the dry leaves all about, to vibrate his plumage so that intricate optical effects are obtained. When no attention rewards his efforts he will find some choice morsel of food to bribe the female's wandering glance.

The pheasant's chief concern throughout the year is to find food and avoid danger. Yet the accomplishment of these prime necessities is jeopardized and handicapped to the breaking point in order that he may have the wherewithal to display himself for a fortnight or so. How much easier the life of a wild Peacock would be if he could dispense with his train and iridescence; how much more of peace and safety an Impeyan might know, if he could carry the hue of sandstone instead of opal.

It is staggering to the student of evolution to attempt to explain the origin and development of such a structure as the orange and black ruff of the Golden Pheasant. It does not appear until the second spring, when an examination of it in detail shows it to be a marvel of intricate specialization. Yet even when full grown it is as imperfect to the eye as a closed fan. Each stick of the fan is meaningless in its carving and painting, and only when it is opened the real beauty flashes into view. Throughout the year the ruff of the Golden Pheasant is folded into a maze of black-marked orange feathers. Only when shot forth full-spread before the eyes of the female do the velvet bars fall into place, reinforced by others, hidden until now, and the whole becomes a sun of wonderful concentric beauty. Thus, in order that for a week or two it may be unfolded a few score of times, perhaps for the average duration of a second, it has been carried for months, ensheathed in apparent imperfection.

Now as to the all-important result. The thought of the little brown hens picking and choosing among their suitors is charming. From an aesthetic point of view even we could accomplish this. Of any three Golden cocks, one is certain to be more ardent, to spread his ruff a little farther, to flatten himself a trifle more completely, to hold his statuesque pose a fraction of a second longer. He is the one to whom we should award the contest, and indeed it is probably he who will succeed in winning a mate. But not from the view point we have taken. However much I should like to do so, I can credit pheasants with no appreciation of the beauties with which they are so generously endowed.

One would like to think of the Golden hens as playing off one cock against another in conscious mental comparison; of appraising this ruff with that patch of gold; this crest of pure spun yellow glass with those stiffened plumes of crimson. To our eyes such comparison is reasonable; the beauty of colour, of agility, of grace, of the cock pheasants—all these appeal powerfully to our aesthetic sense. But long-continued observation forbids such an interpretation. That the colours and the wonderful pinwheeling of the orange and black ruff about the glowing eye, the infinite patience striving continually to bring all the pigments and patterns of the body, of both sides at once, constantly to the attention of the female; that all these are of paramount importance in the courtship we cannot doubt for a moment, but that their effect is similar to the effect upon our minds is another matter.

Stand close to a dozen Golden Pheasants thus courting, with the hot sun beating down, and idly watch them for many minutes. The circling, dizzy movements and play of blazing colours will soon have its effect, and one presently ceases to watch definite birds, or definite actions; the whole scene resolving itself into a soothing kaleidoscopic display, one's eyes and mind being content to register only the general polychrome effect. One finds oneself day-dreaming, the eyes focusing on no particular object. It seems to me that the most reasonable explanation of the wonderful performance is of a mental effect upon the hens, not aesthetic, not directly critical or attentional, but a slow, indirect influence upon the nerves, the arousing of a soothing, pleasing emotion which stimulates the wonderful sequence of instincts which will result in nest-making, egg-laying, the weeks of patient brooding and the subsequent care of the young through day and night, in fair weather and in storm.

This explanation implies no deprecation of the importance of sexual selection. The male who, either by vanquishing his rivals or who by strength and persistency most frequently and effectively displays, will win the hen, regardless of whether the actual process be by aesthetic appreciation or by some subconscious hypnotic-like influence. Yet, when we remember how impossible of definite explanation the term aesthetic appreciation is in ourselves—how no two people in the world have the same appreciation of art, music or nature, and how widely apart are the ideals of beauty of the various races of mankind, we may perhaps say that my explanation has rather worked round in a circle and that it is, after all, a very primitive form of aesthetic feeling.

We are all familiar with the pitifully degenerate courtship of the barnyard cock, a momentary, awkward trailing of a particoloured wing. This is the lateral display in its simplest form, culminating in the complex performance of the Amherst and the White-tailed Pheasants. The essential effort is to depress the side of the body toward the hen, flatten the back and elevate the opposite so that as much as possible of the colour on both sides is brought into view. The tail is twisted to one side and spread, the crest is raised, or the wattles displayed. Then, if the hen is looking, the bird freezes

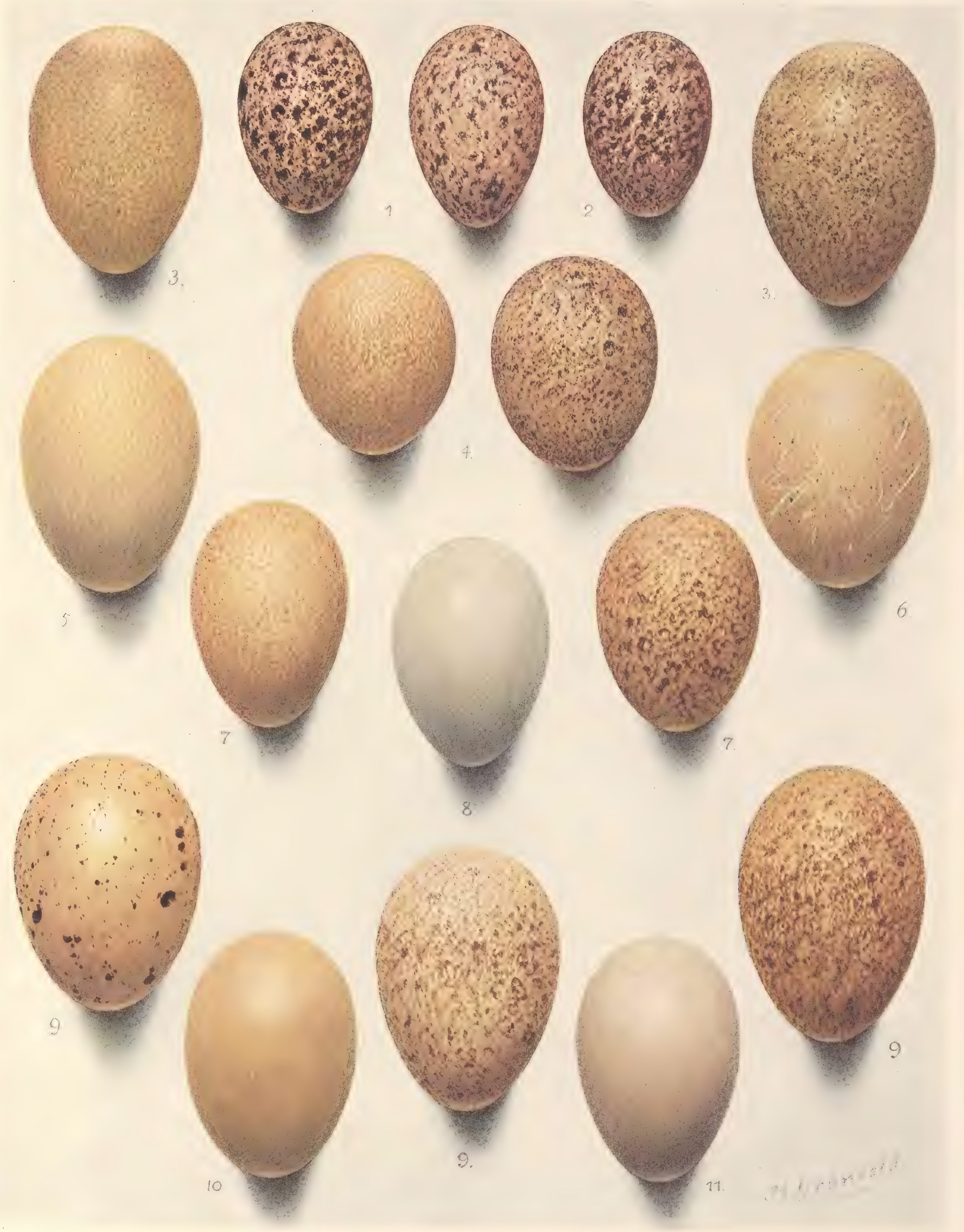
PLATE II

EGGS OF BLOOD PARTRIDGES, TRAGOPANS, IMPEYANS AND EARED-PHEASANTS

1. Two eggs of Geoffroy's Blood Partridge (*Ithagenes geoffroyi*), Tachienlu, Western China, collected by Mr. Pratt.
2. Egg of Kuser's Blood Partridge (*Ithagenes kuseri*).
3. Two eggs of Satyr Tragopan (*Tragopan satyra*), laid in captivity.
4. Two eggs of Cabot's Tragopan (*Tragopan caboti*). The left-hand one collected in Kuatun, China, May 17, 1878, by J. D. D. la Touche; the right-hand one laid in captivity in Yorkshire, England.
5. Egg of Western Tragopan (*Tragopan melanocephalus*), laid in captivity.
6. Egg of Blyth's Tragopan (*Tragopan blythi blythi*), laid in Assam in captivity, by a bird from the North Cachar Hills.
7. Two eggs of Temminck's Tragopan (*Tragopan temmincki*), from "China."
8. Egg of Brown Eared-Pheasant (*Crossoptilon mantchuricum*), laid in captivity in the Zoological Gardens, London.
9. Three eggs of Impeyan Pheasant (*Lophophorus impeyanus*), all from northern India; the centre one collected at Lookel, June 1, 1874.
10. Egg of White Eared-Pheasant (*Crossoptilon tibetanum*), collected by Mr. Pratt, near Tachienlu, May 1890.
11. Egg of Blue Eared-Pheasant (*Crossoptilon auritum*), laid in captivity.

All from the British Museum Collection, except Nos. 2, 5 and 6, which are from that of Mr. Stuart-Baker.

PLATE II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11.

EGGS OF BLOOD PARTRIDGES, TRAGOPANS, IMPEYANS AND EARED-PHEASANTS.

into some statuesque pose for as long a time as he thinks worth while. In the frontal display the cock faces the hen, and in order to exhibit his entire upper plumage bends far forward, his breast almost touching the ground, bill pointing downward. If the wings are the chief ornamental feature, as in the Argus, these are spread into a great sweep of feathers, which meet in front and shut out even his head and neck from view; if it is the train of the Peacock which is the *chef d'ouvre*, it is spread widely, and the wings and tail subordinated, either as a supporting framework or as furnishing castanet quill music. In the Peacock Pheasants the tail completes the lateral two-thirds of wing ornament, rounding them out into a symmetrical whole.

The combats between rival males occur at the breeding season. In some groups, such as the Ocellated and Argus Pheasants, spurs are absent, while the Blood Partridges and all the Peacock Pheasants have two or more pairs. Number is no criterion of pugilistic tendency, however, for the most confirmed fighters are the Junglefowls and Firebacks, armed with a single pair of long, curved spurs, sharp as needles. In the Crestless Firebacks even the hens are armed. These birds not infrequently kill one another. Red Junglefowl appear to have fighting arenas, open spaces in the forest to which combatants resort for the purpose of settling their rivalry. This is interesting as showing an approximation to the assembling places of the prairie hens in the western part of our own country.

No detail or portion of body or plumage is exempt from contributing to the supreme annual fête of courtship. Wattles, combs, fleshy horns and great aprons all enlarge and become colourful. The hues of beaks, legs, toes and even the iris of the eye increase in brilliancy, and mentally the birds are at their height, reckless of danger, and yet with all senses so attuned that they anticipate and evade it. Ready to fight to the death if need be, to neglect food, drink, siesta, to carry to a successful issue, however unconsciously, the third great duty of their lives, the perpetuation of their race.

There is scarcely a genus of pheasants about whose domestic habits as regards monogamy and polygamy I have not had to change my opinion. I have finally come to the belief that all are sometimes one, sometimes the other. The normal condition is the mating each year of a cock and a single hen, and all the groups will show this relation frequently, while in a few it is the rule. On the other hand, where hens are abundant, a harem of two, three or four will often be found associated with one cock. These hens will frequently nest close together, and the cock remain in attendance on all. In birds of more solitary habit, the hens will wander away and go through the nesting and rearing seasons altogether alone, the cocks gathering in loose social flocks.

If we exclude the group of Tragopans, which, after all, finds a place in this work only by courtesy, pheasants are remarkably homogeneous in the matter of nesting. Tragopans are decidedly arboreal and, although seldom making their own nest, they alter and add to the nests of ravens and other birds, and therein deposit their eggs. Even when they choose some spot on the ground they give it a substantial shape or lining of twigs and leaves.

All other birds within our scope are essentially ground nesters. The spot chosen is usually in forest or jungle, near some partly open area, and close to the base of a tree, a tuft of grass, or under the shelter of a boulder or dense shrub or bamboo. A slight hollow is sometimes scraped clean and rounded out, or the depression may be caused merely by the pressure of the bird's body, and the eggs laid on the natural debris of leaves and moss which happens to be there. Perhaps as part compensation for their conspicuous size, terrestrial habits and abundance of enemies, pheasants deposit numerous eggs. The actual extremes range from two to eighteen or twenty, with the average seven or eight. The Tragopans are of interest in that the number seems quite certainly determined by the location of the nest. When placed in a tree or in an elevated nesting-box in an aviary, two is the usual clutch. In a ground nest, four or six may be deposited, but even here the tendency to division into couples is well marked, both by colour, size, and a longer interval between the deposition.

The members of the subfamily Argusianinae, comprising the Peacock Pheasants and the Argus, are set off from all the other true pheasants by laying only two eggs, although in captivity, in the case of the former birds, as many as seven clutches may be induced by systematically removing the eggs. These are probably the wariest of pheasants, and, indeed, they must need all the cunning of the feathered world to hold their own with such a lessened chance of numerous offspring. The Cheer and the True Pheasants lead in the matter of number of eggs, and correspondingly their life in the open, often where trees affording safe perches are few and small, must greatly increase the risks of death.

As regards colour of egg, pheasants fall into the following classification—

EGGS PLAIN

Kaleege and Silvers (*Gennaeus*)
Crestless Firebacks (*Acomus*)
Crested Firebacks (*Lophura*)
White-tailed Pheasants (*Lobiophasis*)
Red Junglefowl (*Gallus gallus*)
Javan Junglefowl (*Gallus varius*)
True Pheasants (*Phasianus*)
Long-tailed Pheasants (*Syrmaticus*)
Golden and Amherst (*Chrysolophus*)
Green Peafowl (*Pavo muticus*)

EGGS MARKED

Blood Partridges (*Ithagenes*)
Tragopans (*Tragopan*)
Ceylon Junglefowl (*Gallus lafayetti*)
Koklass Pheasants (*Pucrasia*)
Argus Pheasants (*Argusianus*)

EGGS SOMETIMES PLAIN, SOMETIMES MARKED

Eared-Pheasants (*Crossoptilon*)
Sonnerat's Junglefowl (*Gallus sonnerati*)
Cheer Pheasant (*Catreus*)
Indian Peafowl (*Pavo cristatus*)

The uselessness of the egg markings for purposes of classification will be evident at a glance, although in some groups of birds it is a valuable minor character of relationship. Here, however, we find the Junglefowl and Peafowl both split up, and the Peacock Pheasants separated from the Argus. Study of the shell structure has been equally unsuccessful, the chief point of interest being the decided isolatedness of the Peafowl, a fact evident in many other ways. Pheasants are conspicuous examples of birds which lay white or whitish eggs in comparatively open nests. Yet, when we come actually to examine the nests of wild pheasants, we find that seldom is one open to the sky. Almost always they are shielded by arching grass or the foliage of some shrub, or at least shut in on two sides by the rough bark of a fallen tree. Then, too, we realize that the protective coloration of pheasant hens is remarkably perfect and effective, and that they are among the closest of sitters, so that the chances are well in favour of a passing marauder missing the low-crouched, motionless form. And, again, very few unmarked pheasant eggs are pure white. They are creamy-white or buff, or even olive-brown or greenish, which among the varied hues of moss and forest debris, and the flickering spots of sunlight sifting down through the foliage, are not unduly conspicuous.

In size the eggs of pheasants vary from small eggs of the Japanese Green Pheasant (*Phasianus versicolor*), only an inch and a half in length (30 × 38 mm.), to those of the Green Peafowl (*Pavo muticus*), over twice as long (54 × 86 mm.). Two distinct factors seem to enter into the period of incubation: actual bodily size of the pheasants and the need of the young to fly as soon after hatching as possible. The two extremes are separated by a difference of about ten days. The Junglefowl, Golden, Amherst and Peacock Pheasants hatch in three weeks; the Silvers, Firebacks, Reeves, Common Pheasants and Argus average twenty-three to twenty-five days; Tragopans require twenty-seven, Impeyans twenty-eight, Eared-Pheasants twenty-eight to thirty, while Peafowl chicks remain a full month within the shell. This succession accurately represents a gradual increase in size from the slender Goldens and Peacock Pheasants, the females of which weigh but fourteen ounces, to the Peahens of six to eight pounds. Correlated with this is the fact that while the flight-feathers of Junglefowl, Goldens and many other pheasants are but slightly developed at birth, young Tragopans, Impeyans and Peafowl can fly and perch almost from the first.

The death-rate among the young of pheasants is very great, in spite of their inconspicuous colouring and their marvellous ability to hide in the scantiest shelter. Two seems to be the average number reared to maturity—at least, that is the average I have observed among many species of wild pheasants. The feeding and care of the young call for no special comment, as they do not differ materially from the domestic habits of fowls or of any gallinaceous birds. The part which the cock plays in incubation and the care of the brood is as variable as the condition of monogamy and polygamy. When his plumage is very brilliant he apparently never goes near the nest, although he may rejoin the hen when she goes off for food, or afterwards when the young birds begin to perch. In more decidedly polygamous species, the female and her brood have still less attention, and she often assumes all the labour of rearing the young. The tail of the Peacock Pheasants is used in a curious manner as a protection for the young. When frightened, or when steadily on the march from place to place without feeding, the two young birds keep at the very heels of their mother, well under the overarching tail, and thus protected from any sudden attack. When they are reared under a domestic hen this inherited habit is often the cause of their death, for while there is no sheltering tail overhead, they keep so constantly close behind the hen that she not infrequently either steps upon them or kicks them while scratching. The young Peacock Pheasants are specialized in still another way. For the first week or so their natural mother is accustomed to feeding them from her beak, and from the failure to do this on the part of the equally solicitous but awkward hen, they sometimes starve to death while actually standing in the food-pan. The young of all pheasants remain with one or both parents throughout their first autumn and winter. The succeeding spring they gradually drift apart. Those which do not breed the first spring and still retain the immature dress, frequently gather in loose flocks composed of several broods, which feed and roost throughout the second year in more or less close association. The second winter such birds as the Impeyans unite, adults, second year birds and young of the year, and remain together during the cold weather. In the spring all breeding cocks must separate or fight, and a parent will kill his full-grown offspring as willingly as a strange rival if they do not leave his domain.

And so to-day we find the magnificent races of wild pheasants, among the frozen steppes of the Gobi Desert, in the flaming rhododendron forests and the sombre deodars of the Himalayas; on the burning plains of India, and in the steaming jungles of Borneo. They feed, they drink, they roost, pay court, fight, love, make their home, feed and shelter their young, always and ever striving to avoid the scores of hungry maws all about them. They wage the battle of daily life or death to the best of their ability, just as their ancestors have done in the past—throughout the decades, the centuries, the millenniums of which we can never know anything. And now, before the hand of man has brought havoc to their last hiding-place, let us rejoice that we have been able to enter, even thus imperfectly, into the intimacy of their lives on the earth to-day.

RELATION TO MAN

Among the nineteen genera of birds which I include in this monograph, there are distributed eighty species, some of which are clearly divisible into subspecific forms, bringing the total up to about one hundred and eight. Here we have one-half of one per cent. of all living birds, and yet it may safely be asserted that, for a number of very different reasons, this small fraction has been, and is, of as much importance to mankind as all the other forms of bird life together. First, from a utilitarian view point, it is not only one genus, *Gallus*, which leads all birds in value to man, but a single species, the Red Junglefowl (*Gallus gallus*). As the ancestor of all varieties of domestic poultry this bird is of inestimable importance to mankind. Whether inmates of the kraals of the most degraded savages, or housed in the elaborate concrete buildings of poultry fanciers of civilization, fowls are widespread over the whole world. Their eggs and flesh are among the most valuable and dependable sources of food which nature has provided. Probably the Esquimo is the only branch of the human family which has been unable to profit from this domestic creature.

I shall only touch upon this interesting subject. The Red Junglefowl is a bird of the greatest significance, standing sharply apart from its fellows by reason of its latent physical and mental possibilities. It is to be compared only with the wild rock dove, the mallard and the grey lag goose. From the Red Junglefowl cock weighing about two pounds, and clad chiefly in red and black, closely resembling the black and red game, has been evolved all of our poultry, from the tiniest of bantams weighing about twenty ounces to the great Brahmas which tip the scales at almost ten pounds. The plumage has been reversed, lengthened, shortened, done away with altogether in certain regions; the colours and patterns altered almost at will, and the proportions of all the limbs reduced or exaggerated. The tail-coverts of a wild cock are less than a foot in length; those of the long-tailed Japanese breed may be over twenty feet long. The mental powers have been affected; pugnacity made dominant, or, on the other hand, the fear of man practically eradicated. From a wild Junglehen which lays at the utmost forty or fifty eggs in the course of her life, we have domestic birds which are veritable egg machines, a single hen producing as many as three thousand eggs. Yet all these are in no sense species, for if the breeding is neglected and the birds are allowed to cross, the succeeding generations soon revert to the appearance of their feral ancestors.

The relation of wild pheasants to mankind is a very one-sided affair. The birds do very little damage to the crops, and even when they make a regular practice of appearing among the grain morning and evening, it is the insect life which is the principal attraction. We realize that this must be so when we see the hundreds and thousands of Ring-necked Pheasants living in and about the Chinese grainfields, working no havoc but probably doing much to keep down the insect pests. Now that the Chinese are, with other occidental innovations, taking to a meat diet, the pheasants are immune in none of their haunts save where Buddhist and Hindus hold sway. Everywhere they are trapped, snared, pierced with poisoned arrows from blowpipe or crossbow, or shot with repeating shotguns. In English governed colonies they are protected by well-regulated game laws, and the brooding hen and the young chicks are immune.

For many years pheasants have paid heavy toll to the millinery trade. Wilson, who years ago gave us good accounts of the habits of the birds, admits the slaughter of over forty-five thousand Impeyans alone, and I have seen huge bales of Silver Pheasant feathers seized in the Rangoon custom house. Nepal and China still export large quantities unhindered, but the market has been so cut down by exclusion laws in Europe and the United States, and the kinds of feathers admitted so definitely defined, that the trade in pheasants' plumage must soon die out.

Taken as a whole, pheasants are more adapted to captivity than any other group of birds. Long after the last wild bird has vanished, several species will persist in captivity. Besides the utility of the Red Junglefowl and the aesthetic value of the Peacock, the Caucasian and the Ring-necked Pheasants are playing an important part in providing sport, and incidentally food for large numbers of people. They are reared in exceedingly large numbers on preserves in many countries, and have been introduced into most temperate regions and important islands. In frequent cases they are actually replacing lost or nearly extinct native game birds, and hence have become important factors in preserving the balance of life on the earth.

ITHAGENES

BLOOD PARTRIDGES

ITHAGENES

BLOOD PARTRIDGES

ORDER GALLIFORMES

Family PHASIANIDAE

Subfamily PERDICINAE

Genus *ITHAGENES*

In general appearance and in actual affinity Blood Partridges are the least pheasant-like of the genera treated in the present monograph. Birds of medium size, they are francolins in general form, but resemble the majority of pheasants in that the sexes are very dissimilar in colour. Both male and female have full, rounded crests; the plumage is long and soft, and especially lanceolate in the males, which also have the margins of the tail-feathers disintegrated. The tail moult is perdicine, not phasianine, and although for this reason the affinities of these birds are with the francolins and partridges, yet I have included them, as, with the tragopans, they appear to be closely allied to the pheasants.

The bill is very short, stout and curved; the facial area is almost bare of feathers; the 1st primary is considerably shorter than the 2nd and 10th, which are nearly equal; the 5th is usually the longest. The tail of fourteen feathers is somewhat rounded, rather long, and about four-fifths the length of the wing. The moult is from within outward. The tarsus is longer than the middle toe and claw, and in the male is armed with from one to five short stout spurs.

In colour the females are of a generalized type, mottled brown with faint indications of some of the masculine patterns. This brown, or more exactly burnt umber, is unquestionably the most primitive colour of the group. The secondary sexual characters of the male (with the exception of spurs and the decomposed tail-fringe) consist only of colour and pattern. The primitive hues of the female are carried to a pigmental extreme in isolated patches of crimson, and structurally altered to the blue-grey dorsal and green ventral body colours.

The short, rounded beak is decidedly non-phasianine (cf. *Francolinus*). The chin and subcaudal patches of specialized colour, hint at partridge and quail affinities

(*Ophyrzia*, *Coturnix*, *Francolinus*); also the pectoral black (*Caccabis*). The primitive condition of the male's crest, differing so slightly in hue and shape from that of the hen, is also a partridge or francolin character. Among the more typical pheasants, the crown is a very favoured place for elaborate secondary sexual characters—combs, crests and plumes.

The blue-grey is far too widespread a character of gallinaceous birds to point in any definite direction. The females show this on the nape, while it comprises most of the colour of the upper parts of the males. This hue almost vanishes when viewed by transmitted light, appearing only as a black pigment in the barbs, showing that it is undoubtedly wholly a structural colour. The peculiar non-iridescent apple-green is a colour almost unique in the Order Galliformes, the nearest approach being the female of *Rollulus roulroul*. The irregular number of spurs leads away from the pheasants proper toward *Galloperdix*, although *Polyplectron* also shows this peculiarity. Jerdon says, rather ingeniously, of *Ithagenes*, "From its small size and numerous spurs, it may be considered as holding the same relationship to the Pheasants as Polyplectron does to Peafowl or as Spurfowl to Junglefowl." This suggested relationship is, however, rather a parallelism than an actual affinity. The eggs remind us both of *Tragopan* and *Coturnix*.

As we shall see, the first individual of this genus was described by Hardwicke ninety-five years ago under the all-embracing generic name of *Phasianus*. In the year 1832 Wagler very properly instituted a distinct genus, *Ithaginis*, for the bird, and ten years later Agassiz amended this incorrect transliteration by a change to *Ithagenes*.

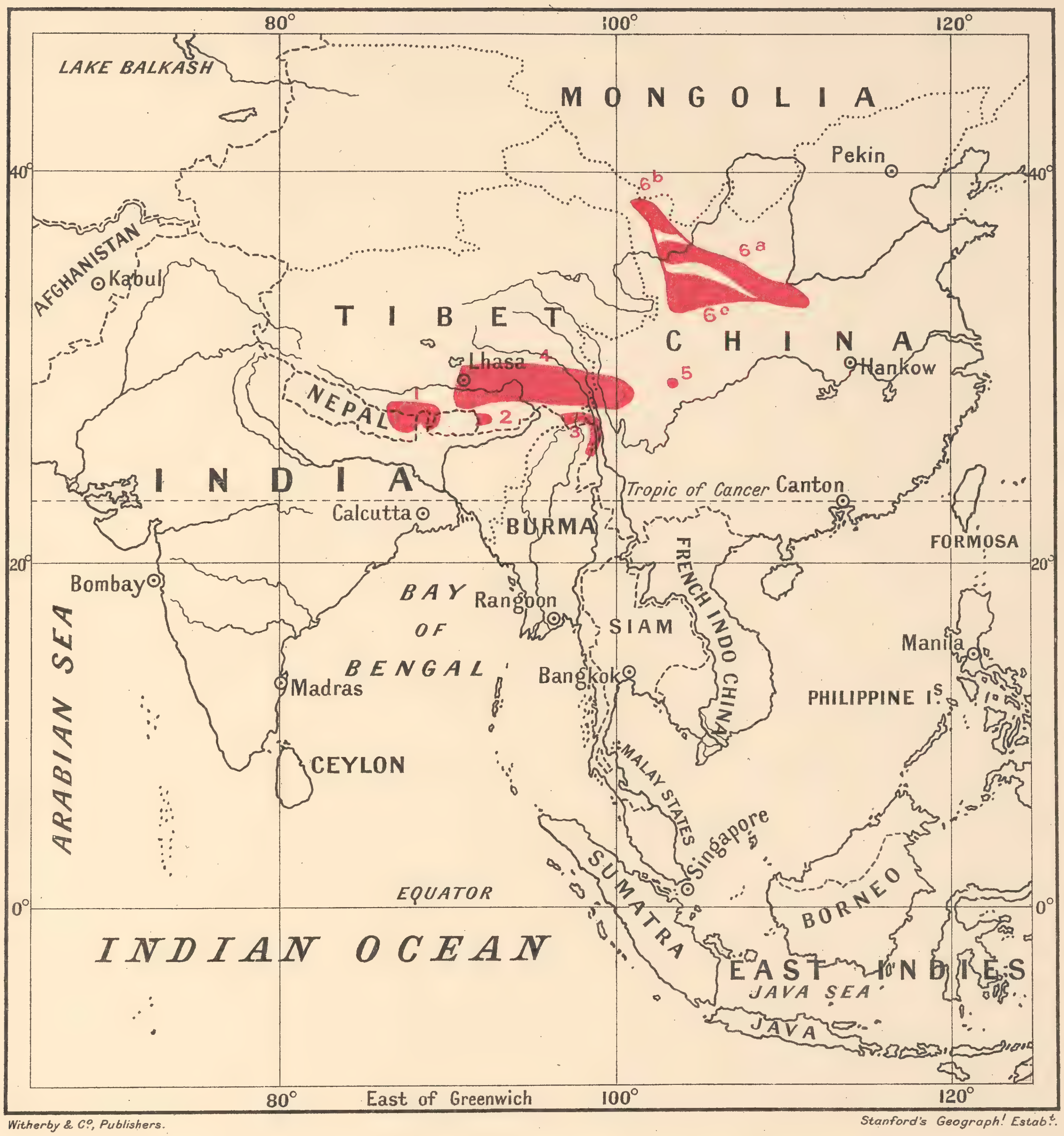
ITHAGENES

	Type.
Ithaginis Wagl., Isis, 1832, p. 1228	*Ithaginis cruentus.*
Plectropus Less., Comp. Buffon, VII. 1836, p. 355	„ „
Plectrophorus Gray, List Gen. B., 1840, p. 61.	„ „
Itaginis Reichenb., Nat. Syst. Vög., 1852, p. xxviii.	„ „
Ithagenes Sund., Av. Teut., 1872, p. 115	*Ithagenes cruentus.*

The genus *Ithagenes* is a well-marked group inhabiting the highest mountain ranges of central Asia. Six species are known, at least two of which are divisible into subspecies. Future exploration will undoubtedly increase the number of forms. The following Blood Partridges are recognized in the present work—

Nepal Himalayan Blood Partridge	*Ithagenes cruentus cruentus* (Hardwicke).
Sikhim Himalayan Blood Partridge . . .	„ *cruentus affinis* Beebe.
Tibetan Blood Partridge	„ *tibetanus* Baker.
Kuser's Blood Partridge	„ *kuseri* Beebe.
Geoffroy's Blood Partridge	„ *geoffroyi* Verreaux.
Wilson's Blood Partridge	„ *wilsoni* Thayer and Bangs.
David's Northern Blood Partridge	„ *sinensis sinensis* David.
Michael's Northern Blood Partridge	„ *sinensis michaëlis* Bianchi.
Berezowski's Northern Blood Partridge . . .	, *sinensis berezowskii* Bianchi.

MAP II.


80°
100°
120°
LAKE BALKASH
MONGOLIA
Pekin
40°
6b
6a
6c
AFGHANISTAN
Kabul
TIBET
CHINA
Lhasa
4
5
Hankow
NEPAL
1
2
3
INDIA
Calcutta
BURMA
Tropic of Cancer
Canton
FORMOSA
20°
Bombay
BAY OF BENGAL
Rangoon
SIAM
FRENCH INDO CHINA
Manila
ARABIAN SEA
Madras
Bangkok
PHILIPPINE IS.
CEYLON
MALAY STATES
Singapore
BORNEO
SUMATRA
EQUATOR
0°
INDIAN OCEAN
EAST INDIES
JAVA SEA
JAVA
East of Greenwich

Witherby & Co., Publishers.

Stanford's Geograph! Estabt.

MAP SHOWING THE DISTRIBUTION OF THE BLOOD PARTRIDGES.

Region	1.	Ithagenes cruentus.
„	2.	„ tibetanus.
„	3.	„ kuseri.
„	4.	„ geoffroyi.
Region	5.	Ithagenes wilsoni.
„	6a.	„ sinensis sinensis.
„	6b.	„ „ michaëlis.
„	6c.	„ „ berezowskii.

KEY TO *ITHAGENES*

- I. Lower breast green (males).
  - a Longer median wing-coverts green.
    - *a'* Throat crimson.
      - *a''* Ear-coverts wholly black . . . . *kuseri.*
      - *b''* Ear-coverts not wholly black.
        - a^3 Lores crimson . . . . *tibetanus.*
        - b^3 Lores black.
          - a^4 Breast spotted with crimson . . . . *cruentus cruentus.*
          - b^4 Breast plain or stained with rusty . . . . „ *affinis.*
    - *b'* Throat grey.
      - *c''* Larger, wing averaging 215 mm. . . . . *geoffroyi.*
      - *d''* Smaller, wing averaging 170 mm. . . . . *wilsoni.*
  - b Longer median wing-coverts not green.
    - *c'* Dorsal plumage with little or no green.
      - *e''* Wing-coverts golden yellow . . . . *sinensis sinensis.*
      - *f''* Wing-coverts cinnamon or chestnut . . . . „ *berezowskii.*
    - *d'* Dorsal plumage decidedly green . . . . „ *michaëlis.*
- II. Lower breast not green (females).
  - a Sides of neck cinnamon.
    - *a'* General plumage brown . . . . *kuseri.*
    - *b'* General plumage rufous-brown.
      - *a''* Warmer in tone; a crimson wash on throat . . . . *cruentus cruentus.*
      - *b''* Greyer in tone; crimson wash on throat very faint or absent . „ *affinis.*
  - b Sides of neck grey.
    - *c'* Breast vermiculated with blackish brown . . . . . . *geoffroyi.*
    - *d'* Breast not vermiculated with blackish brown.
      - *c''* Darker and smaller; wing 190–199 . . . . *sinensis sinensis.*
      - *d''* Paler and larger; wing 203–210 . . . . „ *michaëlis.*
  - c Sides of neck brownish . . . . „ *berezowskii.*

While I have separated the Himalayan Blood Partridge into two subspecific forms, the distinction, in this case, is of interest chiefly to the student of geographical and pigmental variation. As the birds are identical in habits, I have treated them together, except as regards synonomy and subspecific description.

HIMALAYAN BLOOD PARTRIDGE

Ithagenes cruentus (Hardwicke)

Names.—Generic: *Ithagenes*, of a true race, Greek, *ἰθαγενής*, legitimate; Specific: *cruentus*, Latin, cruentus, stained with blood; English: Blood Pheasant or Partridge, from the crimson spots on the breast; French: Francolin ensanglauté; German: Bergfasan, Indischer Blutfasan, Grünhuhn; Vernacular: Somong-pho (Lepcha, Sikhim), Semo (Tibetan and Bhutian, Bhutan), Chilimé (Nepal).

Brief Description.—Male: Bluish-grey above, with white shaft-streaks; wing-coverts greenish; a buff cap; greenish below with crimson throat, under tail-coverts and breast spots, the latter reduced or absent in birds from southern Sikhim. Female: Reddish brown, finely mottled with black; forehead, face and throat cinnamon; crown and nape blue-grey.

Ithagenes cruentus cruentus.

Type.—Male; *Phasianus cruentus* Hardwicke, "Nepaul," Trans. Linn. Soc. XIII. 1822, p. 237. Female: *Phasianus gardneri* Hardwicke, "The snowy mountains north of the Valley of Nepaul," Trans. Linn. Soc. XV. 1827, p. 167. Both male and female types are in the British Museum.

Ithagenes cruentus affinis.

Type.—Male and female; Beebe, "British Sikhim, near Nathang," Zoologica, I. No. 10, 1912, p. 191. Both male and female types are in the American Museum, New York.

Range.—Nepal and Sikhim.

THE BLOOD PARTRIDGE IN ITS WILD HOME

I waited, motionless, crouching in the shadow of a great frost-split boulder. Behind me, the wall of a jagged cliff rose straight toward the heavens—a giant wall that seemed to set me apart utterly from the world that lay beyond. Within a morning's march of me was the little world made up of my camp and my men, and far away, across wastes of land and water, was the great world of civilized men, where countless human beings were creating and solving the small complexities of their daily life. But I was alone. I had come into a new land, and the gates behind me were closed.

Far overhead, against the intense blue of the sky, a Himalayan skylark hung on fluttering wings, sending its jubilant notes down to the sloping snow-fields beneath. It was only a dark mote above me, but its melody came through the thin, icy air startlingly beautiful and clear. It was springtime, and the small songster felt called upon to tell the joyous fact to the eastern Himalayas. Indeed, there was no need for it to carol such an obvious thing, for spring was everywhere for all to see—but then, many needless things are beautiful.

The arctic meadow which swept downward toward the deep gorges of the Changthap was dotted, between snow patches, with the warm pink of new-blown primroses. These delicate little flowers bloom and live out their short lives under the frown of eternal winter. Rising high above them, clear cut as diamond against sapphire, were the wonderful peaks of snow—Kinchinjunga the indescribable, and the scarcely less glorious Kabru, silent, mysterious—so isolated that they seem wholly detached from the earth beneath. Even beside me, winter was fighting for a stronghold; in the purple

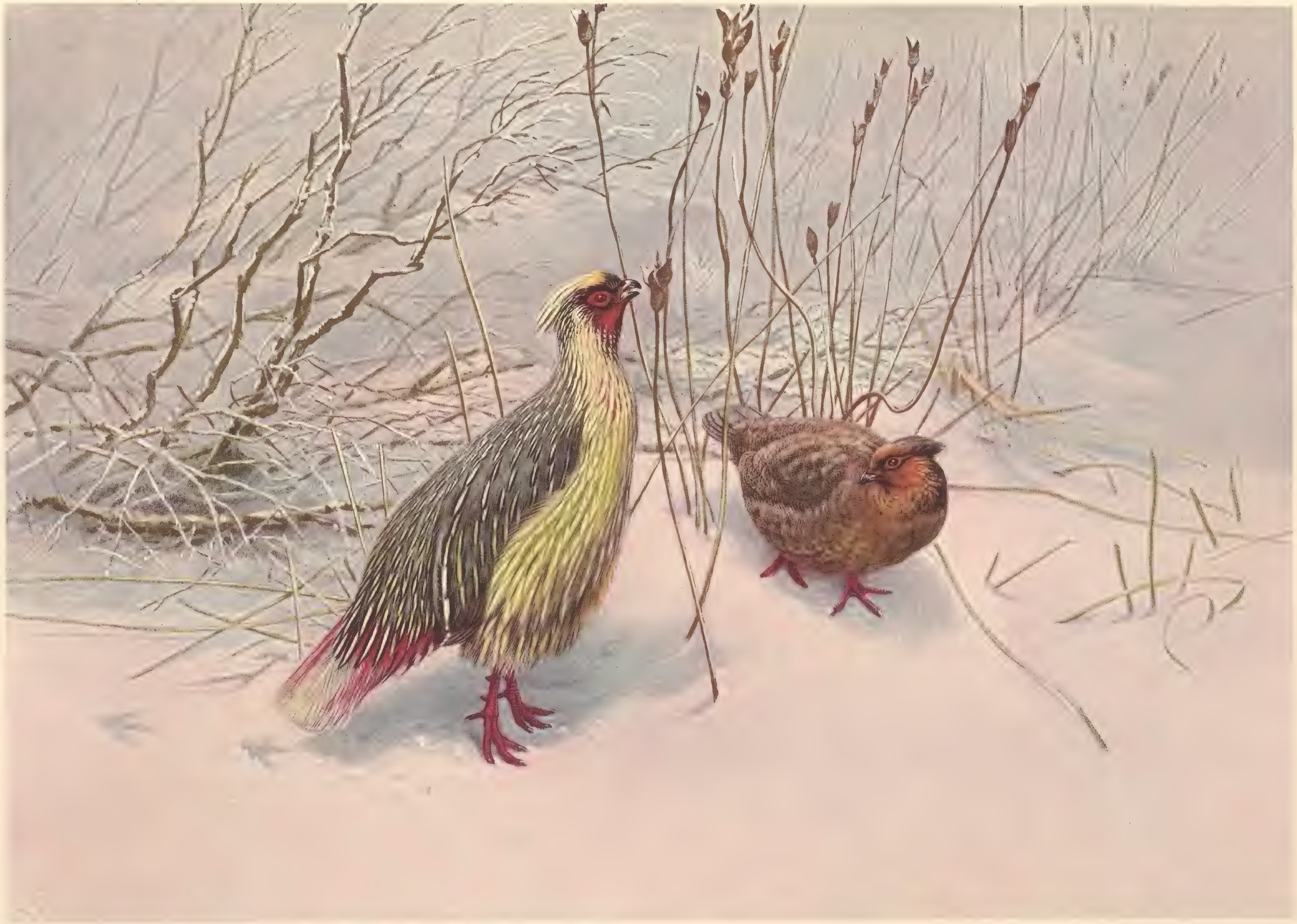
PLATE III

SIKHIM HIMALAYAN BLOOD PARTRIDGE

Ithagenes cruentus affinis Beebe

Blood Partridges keep close to the edge of the melting snow, gradually ascending in the spring and summer. But in the high altitudes of the Sikhim mountains, late spring storms often cover every growing plant deep in snow. To obtain food the Blood Partridges are obliged at once to retreat far down the valleys to where the warmth has turned the snow to rain. Occasionally the birds are able to remain storm-bound and yet find food. This occurs when the insects, caught suddenly unawares, retreat in numbers to pass a few days benumbed with the cold in the seed cases of last year's lilies. Some of these are empty, others partly filled with seeds, and here earwigs, beetles, moths and spiders find a temporary haven. And this haven at least one flock of Blood Partridges discovered and ruthlessly rifled, spilling insects and seeds upon the snow and feeding to its heart's content.

PLATE III



SIKHIM HIMALAYAN BLOOD PARTRIDGE.

shadows of the cliff were small, scattered islands of white, pitted with falling drops from overhanging icicles. It was so still that sometimes I could hear the faint tinkle of these drops breaking through the thin ice crust of the snow. But it was a stillness made up of countless sounds—so many of which had no meaning to me. I heard only the song of the lark, and the murmur of a hundred rivulets, trickling along the first stages of their long voyage to the sea.

I waited, watching, careful of every movement, and the afternoon light deepened around me. Then above me, like the rush of a sudden tempest, came the loud beating of wings. A great lammergeier swept over the edge of the cliff out past me into space. It circled again, its red eye gazing fixedly down at me, as if to discern whether death had made me worthy of closer attention.

I watched, always, for the other living things of this meadow—a meadow, though miles above the sea. I could see the faint outline of a vinous-throated pipit, sitting close on its nest. Snow was above and beneath it, but an overhanging bank of turf shielded the small dwelling-place. Sometimes a tiny, dark form would creep out into the coarse grass—one of those strange little voles which choose these bleak regions for their tunnelled homes. Above them, flies and gnats were dancing in the thin air, and on a bit of stunted bamboo a tortoise-shell butterfly flattened its bright wings in a little oasis of yellow light.

Without warning, the sun dropped behind a distant ridge. It was as if some one had turned out some enormous lamp. Luminous clouds appeared in the air that before had been so clear, and the first whisper of the cold night wind echoed softly in the crags. The insects vanished, and one by one the icicles and rivulets were silenced at the touch of the coming twilight. From a high ravine came the plaintive call of a white-capped redstart, and a grey fox barked from somewhere afar off. Then, in the rich afterglow reflected from the mountains of snow, seven birds appeared over the crest of the ridge. They came slowly, one after the other, and I knew them at once for the Blood Partridges I had come so far to find.

Through my glasses every feather was distinct, every movement clear as the birds straggled down the slope. Now and then several of them would loiter and pick at the abundant red berries. But they did this carelessly, almost perfunctorily, being quite evidently not hungry.

A small moth, his wings half benumbed, tried to fly before them. He was a delicacy, and as such, was promptly pursued and captured. Three of the Partridges were adult male birds, and the four others were clad in the warm brown hue of the hens. As they picked their way from one tussock to the next, now over the coarse, tangled grass, now through a half-frozen patch of snow, their tails were held high, and the crimson beneath shone brightly. A hen pecked viciously at the bird beside her, and was answered by a low, resentful double note. It was the only sound made by the little covey.

As the Blood Partridges drifted down the slope, they ceased their loitering and advanced more steadily, stopping only now and then to watch and listen. They drifted further and further away from me, until they seemed but little windswept fragments of the meadow itself. I watched them eagerly, cautiously—watched them until they vanished among the uppermost ranks of the dwarf rhododendrons.

I stood up, stiffened with cold and my long waiting. In the west, I saw the last pink tinge die out upon the clouds which now hid the snows. As I turned toward camp a single snowflake melted on my face, and I realized anew how grimly winter fights for supremacy far up on the world's roof. I realized, too, that I was tired; but it was a weariness fully rewarded. I had seen the Partridges of the Snows.

GENERAL DISTRIBUTION

The Himalayan Blood Partridge spends its life farther from the centre of the earth than any true pheasant. We may apply to its haunts the exceedingly hackneyed phrase "the Roof of the World" or, with Kim's Lama, we may speak more familiarly of them as "the hills." The centre of its limited range is one of the loftiest of all these "hills"—Kinchinjunga. The distribution of this Blood Partridge is thus confined to the higher ranges of the south-eastern Himalayas. Its ability to withstand the rigors of the climate at high altitudes is apparently limited only by the necessity of food supply. Its life zone lies between nine and sixteen thousand feet, reaching either extreme but rarely.

In such situations it is found throughout native Sikhim, but is absent from the Darjeeling district. It has long been exterminated from the southern part of the Singaleela range. It has been observed along the southern border of Tibet, north of Kinchinjunga, and is not uncommon in the Chumbi Valley, east of Sikhim. The late Maharajah of Nepal wrote me that the Blood Partridge was unknown to Nepalese hunters west of Katmundu, but was distributed to the north and east, in the general direction of Everest and Kinchinjunga. Birds have been shot in the high mountains of extreme western Bhutan, but until political boundaries are shifted, or foreigners are allowed to enter these forbidden lands, the exact east and west range of this species cannot be determined.

GENERAL ACCOUNT

Individual coveys or birds do not wander far, but remain rather closely to some one mountain spur. There is a marked seasonal altitudinal migration, induced by the annual advance and retreat of snow and general arctic conditions. But the birds descend only as far as they find it necessary, and frequently remain near snow-line the year around.

In the autumn, about October, the Blood Partridges which have bred in the same neighbourhood unite in a rather compact flock of several families, including both old and young, numbering from fifteen to as many as forty birds. Occasionally a single family of six or eight will compose the winter covey. These remain together throughout the winter, roosting and feeding in close companionship. The sexes are either equal in numbers, or with a slight preponderance of cocks.

For birds of so gregarious a nature, Blood Partridges are remarkably silent, and seem to convey warning or suspicion of danger to one another more by posture than voice. For instance, when a covey is busily foraging and one of the birds draws itself up to full height and gazes intently at some object, the entire flock at once ceases feeding and remains immovable until the suspicion passes. Like most inhabitants of high or arctic altitudes, they are not wary, and unless they have been persecuted, they will prefer to watch curiously any unusual object rather than run off. In this they differ most markedly from species living at lower altitudes.

When, however, danger actually threatens so that they have to flee, all the members of the flock give voice to a series of sudden, sharp notes—*seep! seep! seep!* After the scattered members of the flock have recovered from their alarm, they utter the covey call, which is only the alarm note drawn out—*see-e-e-e-e-lpe!* snapping off short at the end. I once heard a call uttered by a male when with the flock, something like *silpe-silpe-silpe-silpe!* which is the nearest approach to what some authors have vaguely called a cackle. The scanty literature in regard to this and many species of true pheasants is indeed chiefly remarkable for vagueness. For example, what are we to gather from Hooker's statement that the Blood Partridge "seldom or never crows."

The usual gait of Blood Partridges is a rather slow, fowl-like walk. They do not impress one with the dignity of the more stately, mincing kaleege pheasants; their carriage is less alert, more matter-of-fact. As Hodgson says, the tail is usually carried low, partridge fashion, except when walking over rough ground, when it is raised, but not spread.

When suddenly alarmed, a covey will rise in all directions, and, quail-like, the flight is scaling, direct and brief. If opportunity offers, on alighting the birds prefer to run up-hill, but the first object is to reach and enter shelter, usually scrub rhododendrons, where they are safe from pursuit. If the underbush is more open, and one follows them up, they will be found separated, listening and watching intently, but so unsuspicious as to take a second glance at the approaching danger before running off again. If trees are near and the alarm comes from a sudden rush on the part of a dog, the covey will take to the lower branches. If the alarm is less abrupt, they scurry off on foot, necks outstretched, heads and tails held rather high.

In feeding, the birds tend always to work out to the open country, passing slowly over meadows, generally within easy running distance of scrub.

Soon after the autumn coveys have been formed, the advance of the snowfall forces them downward. They seem to show no partiality for either northern or southern exposures, but are found both on exposed and protected slopes, lower down, of course, on the former. While they spend much of their daily life at this season in the open, it is almost always in the vicinity of patches of low, dense undergrowth. In the eastern Himalayas the silver fir and rhododendron forests share much the same zones. At eleven thousand feet the firs predominate, while, two or three thousand feet higher, the taller trees gradually yield to a dense growth of rhododendron scrub. In certain parts of Nepal these birds are reported to prefer clumps of mountain bamboo.

The winter home of the Blood Partridge is among the open coniferous forests of fir and juniper nearer the lower levels. Here it is kept company by the hardy Himalayan nutcrackers and coal tits, while hosts of northern sparrows and finches feed with it amid the weeds and scrub. There is no hard-and-fast line, however, and these partridges may occasionally be found away from trees amid deep snow in January, as Hooker has reported.

In the spring of the year a slow, irregular ascent takes place, and the summer haunts of the Blood Partridges are hardly lower than the upper zone of small pines, while they range upward to the tundra-like alpine meadowland itself.

DAILY ROUND OF LIFE

The food varies both seasonally and with the locality. Hooker's observations, copied by so many recent authors, were based chiefly on birds in forests of fir during heavy snowfall. He found them almost unpalatable, owing to the turpentine flavour imparted by a diet of newly sprouted fir and juniper sprouts. Blanford speaks of them in late September as good eating. Their diet consisted at this time of small fruits, leaves, seeds, and the spore cases of moss. Hodgson includes insects and grass in their menu, and states that they do not feed on the various bulbous roots so beloved by impeyans and pandas. I can add tender bamboo shoots, the scarlet berries of a creeping vine, and the pips of the Sikhim white rose to the vegetable food list of this Partridge.

Once in Nepal, close to the Sikhim line, I found a family of five Blood Partridges feeding in a most interesting way. The region was devoid of all but grassy vegetation, with a few scattered clumps of low barberry bushes. A heavy snowfall, unseasonable, as it was mid-April, had covered the ground and hidden all the seeds and leaves of the low-growing plants. What I had not noticed during previous days was now made conspicuous by the background of snow—the abundance of clumps of tall stems, each topped with the seed-case of a last year's lily. These three-parted, brown and brittle cups showed where in past months had bloomed scores of red and yellow blossoms. I was able to watch the feeding Partridges for only a few minutes before a raven discovered me and croaked his disapproval, sending the covey scuttling off along the hillside and over the nearest ridge. At the same time a flock of pipits and finches flew up and away.

The snow was soft and I read in its surface the confirmation of what I had observed. The Partridges had appeared to be leaping up at the seed-cases, or pressing against and bending down the stems. I carefully examined many which had been thus disturbed and found that there was good reason for these actions.

The fierce gales and winds of the past winter had tipped and swayed the lily-seed goblets, and the flat, reddish seeds had been scattered over moss and snow, skimming along on their circular wings for many yards around. But with all this upsetting, only about half of the seeds had been shaken out. I have spoken in a previous paragraph of the insect life which was noticeable even after a heavy fall of snow, and I found that one secret of their presence was the half-emptied seed-cases, which, on these high, treeless barrens, formed safe and snug retreats. Into one case a rove-beetle had crawled; into another a small moth, although, owing to the number of seeds still remaining, the tips of the insect's wings protruded from the top. Here two tiny flies were resting, hardly able to use their legs, much less their wings, in the chill of the morning. There is no doubt but that these insects remain in their retreats in a state of semi-frozen hibernation until the return of more seasonable weather.

When the snow and ice covered thickly all other food, the Blood Partridges found here a bountiful feast—both of seeds and insects—in the lily cases. The maze of

PHOTOGRAVURE IA

WINTER HOME OF THE NEPAL HIMALAYAN BLOOD PARTRIDGE

In the Eastern Himalayas the limit of perpetual snow is at sixteen thousand feet, and in winter the storms rush down from the crests and sweep everything before them to tree level. Even the hardy blood Partridges have to retreat and seek shelter and food several thousand feet lower down. Here the great pines and spruces defy the elements, rearing their sturdy gnarled trunks and spreading wide their scraggy branches. Between their trunks extend dense masses of stunted rhododendrons, and among these the Blood Partridges spend the long winter days. From the pines come the voices of titmice and nuthatches and creepers, and now and then the shadow of a passing vulture cuts through the icy air. Only lonely Nepal shepherds ever visit these slopes. It matters not to the birds that farther down in the valley there is warmth and insect life. There too are safe roosting places. The Blood Partridges will have none of these, but cling to the edge of the tree-line, ever ready to work upward at the first hint of spring.

WINTER HOME OF THE NEPAL BLOOD PARTRIDGE

tracks revealed the patience and activity of the Partridges in levelling the stems, while in a wider circle around the scene of action the dainty footprints of skylarks, pipits, and finches were everywhere interlaced, showing that they had learned how to secure a portion of the stray seeds which were thrown upon the white surface from the efforts of the Partridges.

When I found that this habit of the Partridges was common to the several flocks which I had the opportunity of observing, I realized how it was possible for these birds to remain at such high, barren altitudes when all other sources of nourishment were sealed by frost and snow. I investigated the seed-cases of a half dozen lily clumps four hundreds yards apart, with these interesting results—

Nine were empty except for a scattering of seeds.

Twenty-six held a single earwig each.

Four held two earwigs (in three instances both insects were in the same partition).

One held an earwig in one partition, and a ladybird beetle and a dipterous larva in another partition.

Three held similar dipterous larvae.

One held a small spider and two small flies.

Five held rove-beetles of two species, one of which proved to be new.

Eight held small chrysomelid beetles.

One held a chrysomelid and a carab beetle, a weevil and a small grey spider.

Two held small moths.

One held a small moth, a mosquito, and a homopterous insect.

Thus almost fifty per cent. of the seed-cases contained one or more earwigs, and some of these, as well as others of the insects, were heretofore unknown species. The conditions at the time of collecting these were as follows: At this season, mid-April, snow covered the ground deeply and remained unmelted for three days. The preceding week had been warm and clear, and insects were abundant, and all those now found in the seed-cases were alive, although too numbed to fly or to do more than move their legs weakly. In no instances were more than half the seeds remaining in the cases, and where the stems were thin and more pliant, almost all the seeds had been thrown out during the winter. The lily clumps were large and a dozen or more stems sprang from a circular mass of dead, prostrate, whitened leaves, the whole forming a mat about a yard in diameter. At this season new leaves were sprouting, and before covered by the snow, showed as straight, vertical, green shoots several inches in height.

I have gone into all this detail for the purpose of throwing light upon an interesting source of food supply of these and other birds during unseasonable snowy weather at high, treeless altitudes.

Unlike the pheasants which live at lower elevations, the members of this genus have no definite time of feeding. One may find them at high noon searching for berries and insects among the moss and coarse grass. There is not the intense midday heat or the array of enemies to limit their foraging to early morning and late afternoon. Blood Partridges, unlike the impeyans, scratch lustily, sending the creeping vines and moss flying, in their quest for animal food. But, also unlike those more brilliant birds, they do not have scratching places. One cannot track the birds by their foraging signs, as is so easy a matter with the impeyans and cheer.

As regards the roosting places, Blood Partridges, in their winter haunts, appear to fly up into the branches of firs, sometimes the entire covey roosting close together. At least, that is the consensus of opinion of sportsmen who have had the opportunity of observing them at this season. In the early spring they are satisfied with low rhododendron trees or even scrub. When the birds settle for the night in a dense thicket of this character they are, indeed, safe, for few creatures could penetrate it, and certainly not without a loud crackling of twigs and leaves.

I have found evidences, in sign and in a stray feather or two, of such a roosting place being occupied for at least several consecutive nights. Tracks of dholes or wild dogs were outside the thicket, but none on the scanty snow beneath the evergreen rhododendron leaves.

In regard to the tunnelling of Blood Partridges into snow for nocturnal shelter, we have only Hooker's authority, his exact words being as follows: "During winter it appears to burrow under or in holes amongst the snow; for I have snared it in January in regions thickly covered with snow, at an altitude of twelve thousand feet." On this vaguely circumstantial evidence scores of writers of natural history volumes have incorporated the burrowing habit, often as one of the principal habits of this species. While snow burrowing is known among grouse, yet the ice, with which the cold night fogs often seal the surface of the snow in the haunts of the Blood Partridge, would make such a custom one of extreme risk. Instead of a regular habit, such a voluntary imbedding in snow is probably of the rarest occurrence, if, indeed, it is not always brought about by the subsequent snowing-in of a covey roosting on the ground, as we have occasionally observed in the case of the bobwhite.

Mr. Luday, an English sportsman, tells me that more than once he has found indubitable proof that these birds occasionally roost on the ground in the shelter of a bit of crag or boulder, and, in this instance, they face outward from the centre, in the regulation quail-like covey formation.

We have little first-hand information in regard to the competitors and enemies of Blood Partridges. There are few consanguineous intruders in their domains, although the monal is sometimes to be found in the same vicinity, but with very different feeding habits. The snowcocks excel even the Blood Partridges in their altitudinal distribution, and seldom approach the scrub and forests.

I have shot a large beech marten and known another to be seen in close vicinity to Blood Partridges, and grey foxes are one of the commonest of carnivores in the upper rhododendron zone. Dholes or wild dogs doubtless take toll when larger game is not to be found, and the Himalayan leopards must look with favour upon these green-feathered morsels. Among birds, the golden and Bonelli's eagles are probably most to be dreaded, although the former is the only one I have actually seen hunting in Blood Partridge country. Of all the four-footed hunters, the slinking, lichen-hued reynard of the rocky alpine meadows must be the worst enemy to such birds as these, whose senses and activity are far from being equal to those of the true pheasants. The rough, rolling, boulder-strewn character of their haunts, and the deadening character of the thick, matted turf all favour the approach of such an animal as a fox, who with a sudden leap must seldom fail in his attack.

In regard to the significance of the colours of the cock Blood Partridge, Waddell writes as follows: "This color scheme is admirably calculated to protect the bird from notice in its favorite surroundings, namely, the granite rocks covered with a pale, greenish lichen, interspersed with patches of a dull crimson fungus. They seldom take to wing, but run quickly and hide amongst the rocks."

I concur in this opinion only to a limited extent. In the first place, there is no doubt but that the colours of both sexes of *Ithagenes* are at times protective. What I consider absolute proof of this came to me one day when I was watching a flock of the birds as they scratched and picked along a bit of open rocky slope. I had them all well within the range of my stereos and suddenly, without warning, every bird squatted, and turning its head sideways, stared unblinkingly into the sky over my head. I twisted partly over in my hiding place of stunted bamboo grass, but only after a long search did I discover the speck in the heavens, which my glasses resolved into an eagle. Another glance at the Partridges showed that all had remained motionless, and they did not move for at least three minutes, when they suddenly resumed their feeding as if nothing had happened. Now the rocks in this instance were coated with pale pink primroses and brown lichens. So it was the females which matched more nearly the latter general tint. There is no chance for the crimson spots and patches on the under plumage—chin, breast and tail—of the male to function in any way whatever when the bird is squatting—all are hidden from view. And we can hardly conceive that their existence is chiefly protective when they are lacking in the males of some of the other species of this genus, all of which inhabit similar open mountain slopes.

The unconscious trust in the protection of a squatting position is, without doubt, indicative of a protective value, such as we see in sand grouse and many other desert birds, quail, and the young of skimmers and terns. But as in the Blood Partridges, to be thus protective, the pattern of plumage need not exactly match the surroundings. The legitimate extent and application of protective coloration may be summed up in the female Blood Partridge. Clad in plumage of mottled reddish brown, she is yet conspicuous when making the slightest movement even among the brown-lichened rocks; she is inconspicuous when squatting, even among greenish grass or pink primroses.

HOME LIFE

Up to the present time no authentic account of the breeding habits has been recorded, nor has the nest or egg of this species been discovered by a white man. We have knowledge of both, however, in the case of two related species, Kuser's and Geoffroy's Blood Partridges (pages 27 and 32), and this data lends credence to the following information given me and independently confirmed by several Lepchas and Tibetans who were excellent observers and hunters. It may be taken for what it is worth.

The Blood Partridge is monogamous, and the pair of birds and their young keep together throughout the winter following the breeding season. In courting, the male spreads its tail and wings, drooping the latter, raises the crest, swells out the breast feathers and struts before the female, turning round and round. The males fight fiercely with each other.

The nest is a hollow in dead leaves and moss, usually near a boulder or stump in rhododendron forest at twelve to thirteen thousand feet. From five to ten speckled eggs are laid, in April or May. The eggs are very good eating.

From my own observation of the equal numbers of the sexes in the coveys, confirming Blanford's statement of the same fact, there seems reasonable evidence of the monogamy of this species. Hooker records "young" seen in May; Jerdon writes of "nearly half-grown young" in September, with the adults moulting at the same time.

RELATION TO MAN

The relation in which the Blood Partridge stands to man is a rather one-sided affair. Unlike some of the kaleege, the Blood Partridges, while not wary birds, will have none of man and his habitations, and soon disappear, if, indeed, they are not shot off, from the vicinity even of a temporary camp. British sportsmen in India look askance at this species as a game-bird, owing both to its unsuspicious nature and its confirmed cursorial habits. When treed by a dog, and absorbed in watching the barking canine beneath, an entire covey may be—and, shame to say, often has been—shot one after the other by the so-called sportsman.

The history of Blood Partridges on the Singaleela Range, that high spur which extends from a point north-west of Darjeeling northward toward Kinchinjunga, is significant of what will soon universally be true of other parts of their limited haunts.

Jerdon mentions a covey crossing his path near Tonglo. An English sportsman records that on November 10, 1880, near Sandukphu, a little farther north on the same ridge, he shot thirty-six birds, of which twenty-two were cocks. In 1900 he rather naïvely writes that the Green Blood Partridge is not now to be seen at all along the Nepal boundary, owing to the forest chowkidars snaring them at all times of the year.

Ten years later, when I visited the southern part of the Singaleela Ridge, I found that this statement was still true, and that the species was entirely absent. Only after crossing the deep gorges of several intersecting streams to the north did I find any trace of these birds, and not until I made a second long circuitous expedition to the vicinity of the snows in Nepal were Blood Partridges found in coveys of any size.

Every year there is a greater demand for sheep, and the Nepalese shepherds consequently increase in number, and seem to spend most of their time in snaring birds of all descriptions. Both nooses and deadfalls are used. But the Blood Partridges suffer far less than the tragopans, as we shall have occasion later to note.

Unlike some species of pheasants, these birds do not take kindly to captivity. Even in Darjeeling several attempts to keep Blood Partridges have ended in failure, the birds living less than two weeks. Although I have inquired carefully, I can find no record of this species in any European zoological garden until the year 1911. On June 3 of that year a pair of Blood Partridges were successfully landed in England and placed in the London Zoo. These, however, died a very short time after their arrival, their death being, perhaps, due to the unseasonable hot weather. Unfortunately, no particular notes were made on the living birds. Mr. W. Frost, who succeeded in bringing this pair of birds from India, writes me that they were captured early in January, and during their voyage and until their death six months later they were apparently in excellent health. They were dainty, rather fastidious feeders, with little liking for grain, although during the time when they were being brought down from the hills the natives fed them solely on soaked paddy. In captivity they enjoyed salad-like foods, such as chopped lettuce, onions, potatoes and carrots, and were keen on insects of all descriptions, roaches, beetles, grasshoppers and mealworms. The males did not care for each other's presence in the same cage, often pecking and plucking angrily at one another. The birds which the Bhotias sometimes bring down to Darjeeling are apparently all hand-reared, as they are young and very tame and show no signs of disfigurement from dashing against the cage tops. In the following year (1912) ten more Blood Partridges, together with eleven Tibetan snowcocks, were secured, but every one succumbed to the Calcutta heat, even before starting on their voyage.

TEXT IDENTIFICATIONS

PAGE.	LINE.	
6	8	Himalayan Skylark. *Alauda gulgula gulgula* Frankl.
6	16	Primroses. *Primula petiolaris* Wall.
7	9	Lammergeier. *Gypaëtus barbatus* (Linn.).
7	13	Vinous-throated Pipit. *Anthus roseatus* Blyth.
7	16	Sikhim Vole. *Microtus sikimensis* (Hodgs.).
7	18	Himalayan Tortoise-shell Butterfly. *Vanessa cashmirensis* Koll.
7	25	White-capped Redstart. *Chaimorrornis leucocephala* (Vig.).
7	25	Himalayan Grey Fox. *Vulpes alopex montanus* Pears.
9	13	Hooker, quoted in Hume, "Game Birds, India," I. p. 156.
9	35	Silver Fir. *Abies webbiana* Lind.
9	35	Rhododendron forests. *Rhododendron arboreum, falconeri*, etc.
9	38	Mountain bamboo. *Dendrocalamus hamiltonii* Nees and Arnott.
9	40	Juniper. *Juniperus* sp.
9	41	Himalayan Nutcracker. *Nucifraga caryocatactes hemispila* Vig.
9	41	Sikhim Cole Tit. *Parus rufonuchalis beavani* (Jerd.).
10	3	Hooker, "Himalayan Journals," 1855.
10	6	Blanford, "Fauna, British India," IV. 1898, p. 104.
10	8	Hodgson, quoted in Hume, "Game Birds, India," I., 1878, p. 155.
10	10	Scarlet berries. *Hemiphragma heterophyllum* Wall.
10	11	Sikhim White Rose. *Rosa sericea* Lind.
10	19	Himalayan Lily. *Lilium* sp.
10	21	Himalayan Raven. *Corvus corax tibetanum* Hodgs.
11	12	Earwigs. *Homotages feae* (Bormans).
11	13	*Forficula planticollis* Kirby.
11	14	Ladybird Beetles. *Coccinella 7-punctata* Linn.
11	17	Two small Flies. An undescribed *Criorhina* and a member of the *Cordyluridae*.
11	18	Rove Beetle. *Osonius beebei* Beurh.
11	19	Chrysomelid Beetles. *Trichotheca hirta* Baly.
11	20	Carab Beetle. *Opisthius indicus* Chaudoir.
11	20	Weevil; *Tanymecus* sp.
11	21	Moth. A *Noctuid.*
11	22	Homopteron. Of the family *Jassidae.*
11	42	Impeyan or Monal. *Lophophorus impeyanus* Lath.
11	45	Cheer. *Catreus wallichi* (Hardw.).
12	9	Dholes. *Cyon javanicus dukhuensis* Sykes.
12	13	Hooker, quoted in Elliot, "Monograph Phasianidae," II.
12	31	Snowcocks. *Tetraogallus tibetanus* Gould.
12	33	Beech Marten. *Mustela foina* Erxleb.
12	36	Himalayan Leopards. *Felis pardus* Linn., and *F. nebulosa* Griff.
12	37	Golden Eagle. *Aquila chrysaëtos* (Linn.).
12	37	Bonelli's Eagle. *Hieraëtus fasciatus* (Vieill).
12	44	Waddell, "Lhasa and its Mysteries," p. 139.
14	4	Blanford, "Fauna British India, Birds," IV. p. 104
14	5	Hooker, quoted in Elliot, "Monograph Phasianidae," II.
14	5	Jerdon, quoted in Elliot, "Monograph Phasianidae," II.
14	18	Masson, "Game-birds of Darjeeling," p. 14.
14	35	Blood Partridges in England, Seth-Smith, "Avicultural Magazine," (3), II. p. 303.

DETAILED DESCRIPTION

Adult Male. — Forehead, lores and feathers around bare facial area, black; fore crown cinnamon, shading behind into paler buff, the crest composed of these buff feathers and of elongated blue-grey ones with white shaft-stripes; nape and mantle grey (Payne's grey) with a white shaft-stripe; scapulars, lower back, rump, lesser and inner median wing-coverts similar, but with the shaft-stripes faintly washed with green and edged with black; outer median wing-coverts with much wider shaft-stripes of apple-green, and the vane outside the black of a dark laurel green. The margins of the upper tail-coverts are of a deep crimson colour, and the barbs are decomposed, making these feathers look very long and narrow.

The primaries and their coverts uniform blackish brown, with the rhachis dark brown proximally, shading into shining white for the distal half, while near the extremity a wide shaft-stripe appears, slightly dilated at the tip of the feathers. The secondaries are margined along the outer edge with a mottling of whitish buff. The tertiaries are margined all around with impure greenish, but are otherwise exaggerated copies of the lower back feathers.

Tail-feathers creamy white at the tip, shading irregularly into blackish brown toward the base. Rhachis as in primaries. Lateral margins of the webs decomposed and coloured deep crimson as in coverts, the crimson decreasing from the middle pair outward, and wholly absent from the outermost one or two pairs.

Featherlets of bare facial area black, except for a circular subocular patch, which is crimson in fully adult males. Auriculars and sides of neck particoloured, partaking of the black, pale green, grey or crimson hues of adjacent areas, according to whether they sprout from the anterior, posterior, dorsal or ventral portions of their zone. Chin and throat dark crimson on exposed parts of feathers, basal half black: posteriorly a whitish-green tip appears and by the increase of this and of the basal black the crimson disappears, and on the lower throat the black almost reaches the tip, and the green has become only a wide central stripe. Continuing posteriorly, the black disappears rather abruptly, its place being taken, about half-way down the feather, by a rusty or orange tinge. On the breast this new tint culminates usually in spots of bright crimson. In the central area of the breast in Nepal birds there is a rounded or slightly elongated spot of this colour on each web. The amount of this pectoral crimson is entirely independent of age. On the sides and lower breast the crimson is usually absent, the green becoming of a deeper and stronger shade. On the sides a pale green shaft-stripe appears and this grades into the white-striped, grey flanks. The under tail-coverts are rich, dark crimson tipped with whitish green. The down of the belly has a strong buffy tinge and the tarsal feathers are of a generalized buff and mottled-white type.

Mandibles black; cere and gape coral-red to intense crimson, in winter paling to salmon colour; iris rich hazel; legs and toes crimson, paler in winter; claws dark horn colour, paler at base.

Length, 438–482 (460); wing, 194–228 (211); tail, 164–178 (171); bill from nostril, 11; tarsus, 66–76 (71); middle toe and claw, 59–65 (62) mm.

Weight, 1 lb. 1 oz. to 1 lb. 4 oz.

PLATE IV

PLUMAGES OF THE HIMALAYAN BLOOD PARTRIDGE

Ithagenes cruentus (Hardwicke)

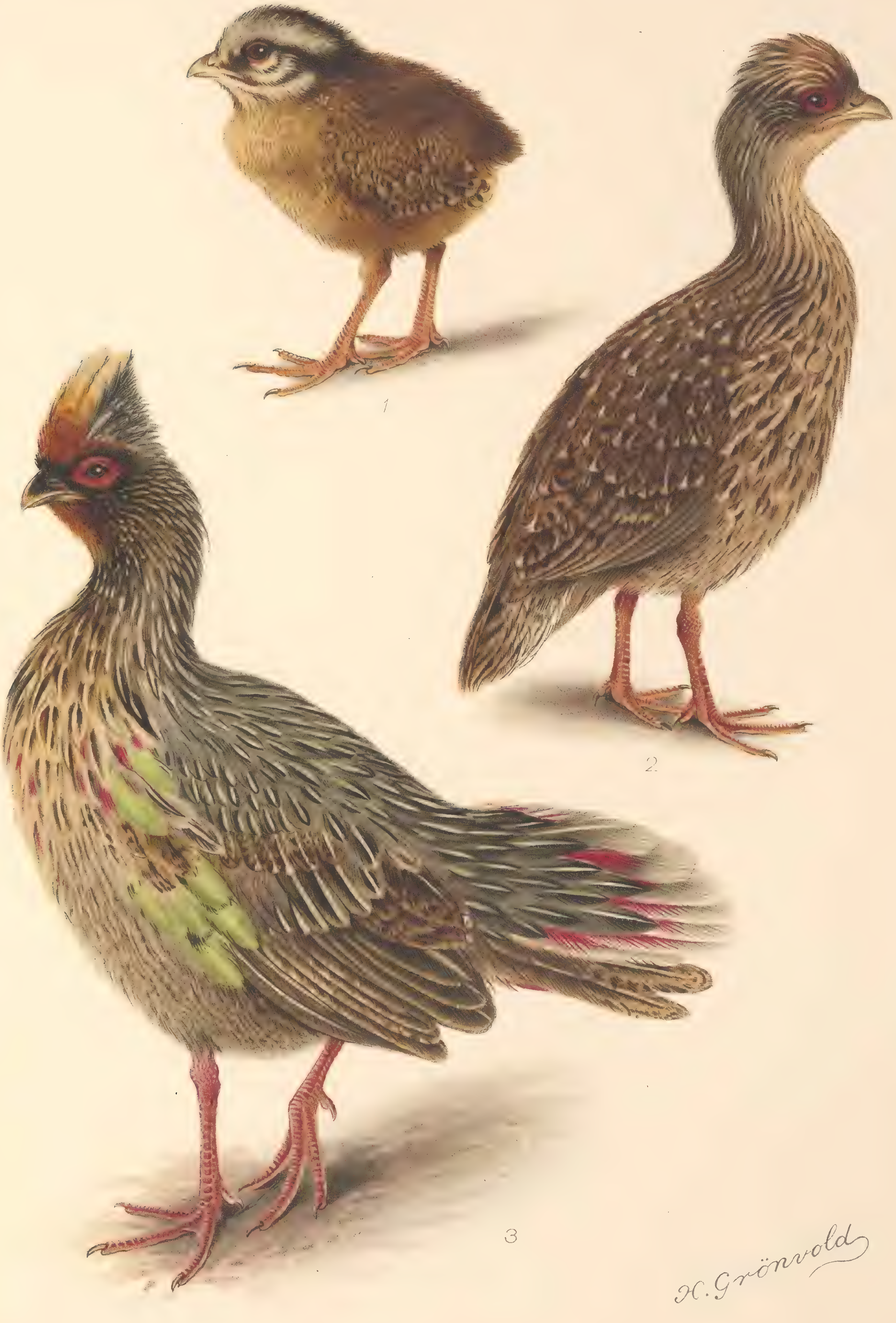
The Blood Partridge acquires its adult plumage during the first year of its life. If a chick slips from its shell in May, it will be hardly distinguishable from its parents in October. Except for a lack of spurs it is as well equipped for the dangers of life as its father.

Figure 1 shows the chick in its down about a week old. The little wings are just visible, but the legs are the most prominent feature. The head and neck are grey and black, and the body is of a warm rufous.

Five weeks later the down has been shed and the young bird is in full juvenile garb of dull mottled buff and black, with terminal spots of pale buff. The legs have increased but little, but the wings and tail show that the bird roosts high and can escape swiftly from any enemy. Figure 2 shows a juvenile bird of six weeks.

In Figure 3 a young cock of two months is well advanced in the adult plumage. Most of the juvenile brown has left his back and tail, and the green and scarlet feathers are rapidly covering the breast. The two outer juvenile tail feathers and the white-shafted outer primaries are still unshed.

PLATE IV


1
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3
H. Grönvold

PLUMAGES OF THE HIMALAYAN BLOOD PARTRIDGE.

Spurs, irregular in number, from one to five on each leg. By far the larger number (60 per cent.) of the cocks have two spurs on each leg; about 30 per cent. have a larger number than this, while only 10 per cent. have fewer than four spurs.

Colour Generalization.—The most primitive mode of occurrence of crimson in the male birds is as subterminal, round spots, one in the centre of each vane. This type occurs in the feathering of the throat, the lesser under tail-coverts, breast spots and even in adventitious pigmentation on the forehead and elsewhere.

In the fully adult males the feathers nearest the centre of the breast bear a crimson spot or blotch on each web, which persists even on some of the sub-alar plumage of the sides. In many cases the distal edges of the spot of bright colour is a straight, sharp, transverse line, corresponding to the fault-bars which are distinct even in the monochrome green, showing that the deposition of crimson pigment began very suddenly. Basally (as in so many of the pheasants) Nature has been economical with her pigments, and on the concealed portion of the feather the crimson fades abruptly into a rusty orange stain, which tinges much of the basal vane—an atavistic reminder of the more primitive tints of the female. The concentrated outpouring of pigment in the breast ornaments of the male is exhausted in the formation of these visible spots, and becomes diluted and lost where the eye of the world—or shall we say of his mate—can no longer perceive it.

In well-marked birds we perceive a decided tendency for the pectoral crimson to form longitudinal streaks, antero-posteriorly. A strongly marked feather on the mid-breast with a spot on the right vane will invariably be followed by a succession of similarly marked feathers down the breast. Even local individual variations in the character of the spots tend thus to be repeated in any series of feathers growing one below the other.

Adult Female.—A typical, fully adult bird has the forehead and fore crown, lores, face feathers around bare space, facial featherlets, sides of the neck, chin and throat warm cinnamon; the auriculars and those continuing down the side of the neck tipped with grey, with a broad buff shaft-stripe bounded by two wide black stripes; crown and nape blue grey (Payne's blue), changing abruptly into the uniform pattern of the rest of the upper parts—a pale rufous brown, thickly vermiculated with blackish brown. The concealed portions of the contour feathers are identical in this pattern down to the grey, decomposed basal barbs themselves. This characterizes not only the lower neck, back, rump, upper tail-coverts, all wing-coverts, and exposed edges of secondaries, tertiaries and rectrices, but also the sides, flanks and lower belly.

Lower throat and entire breast clear burnt umber lacking the dark vermiculations, which begin again rather abruptly on the lower belly. The paler cinnamon of the throat is continued downward throughout the whole of this clear ventral area as a pale buff shaft-stripe.

The plumage of the lower parts darkens posteriorly, until in the under tail-coverts, blackish brown predominates, the umber being reduced to a few irregular mottlings.

The flight feathers are, on the whole, a uniform dark brown, the mottling being absent in the primaries or reduced to a narrow outer edging. In the secondaries this mottling of pale rufous brown occupies most of the outer web and the rim of the inner one. Under wing-coverts uniform dark brown. The rectrices, away from the mottled edges of the feathers, are of a similar uniform dark shade. On all the smaller, mottled contour feathers a distinct purplish sheen or gloss is visible when viewed very obliquely, the tint being the same whether observed from the anterior or posterior point of view

Mandibles black, sometimes with tips and bases dull reddish. Cere and gape yellow-carmine, pale salmon in winter. Iris, hazel brown. Legs and toes, intense carmine, paler in winter. Claws, dark horn at base, shading into black.

Length, 394–420 (407); wing, 179–197 (188); tail, 140–154 (147); bill from nostril, 9–11 (10); tarsus, 56–70 (63); middle toe and claw, 54–57 (56) mm.

Weight, 12 oz. to 1 lb. 1 oz.

Over half of the females show no signs of spurs; 20 per cent. more have a single blunt nodule on each leg, while others show 0 + 2, 0 + 1, and 1 + 2. Very rarely they are fully developed into sharp functional spurs.

Colour Variation.—The female shows more hints of the adult masculine hue and pattern than are at first apparent. Seldom is the crimson colour altogether lacking, either as decidedly crimson feathers or as a strong rosy wash of the feathers of chin, throat, and face and more rarely on the breast. Instead of an exceptional case, suggesting, as Ogilvie-Grant thinks, the masculization of plumage in a barren female, such coloration is rather the rule in western individuals. In the hens with the largest amount of crimson, there is a correlated brightening of the cinnamon of the crown, face and throat. Nepalese specimens show distinct traces of red on the rectrices and under tail-coverts.

The area of the grey nuchal patch is inconstant and in the variability both of the dark mottling and of the grey colour, individual *cruentus* females approach closely to the hens of *geoffroyi* and *sinensis*. The plate in Gould's "Birds of Asia" shows an extreme of the former variation.

In the clear pectoral area, the pattern of the male is indicated by the pale shaft-stripes and in many feathers by a decided concentration of black pigment on each side of this central stripe.

EARLY PLUMAGES OF *ITHAGENES*

The Blood Partridges are almost the only genus of birds lying within the limits of my research which have not been extensively kept or bred in captivity, so that the changes of plumage have heretofore never been observed, nor even described.

Natal Down.—Chick about a week old. General colour scheme; head and neck grey and black, body rufous.

Loral and malar streak, circle around eye, large infra-auricular spot and line extending backward around the nape, centre of crown and wide nuchal band brownish-black. Remainder of head, throat and neck pale grizzled grey. Beginning abruptly at the lower neck all round, and backward over entire body, the down is dull rufous with slender black tips, except on under parts, where the rufous is paler and purer. Seven primaries, eight secondaries and several greater wing-coverts even at this early age are well in evidence, the former having pushed out about 18 mm. beyond their sheaths, the wing measuring 45 mm. The down clinging to the tips of the growing flight feathers is rarely in a single distal cluster, more commonly with the separated down filaments supported on the extremities of several distal barbs. The sprouting wing feathers are of unusual breadth, dark brown, mottled irregularly with buff, and tipped with pale buff. Bill from nostril, 6; tarsus 23 mm.

Juvenile Plumage.—Bird about five weeks old. The dorsal plumage is uniformly of a dull mottled buff and black, each feather with a very conspicuous, terminal, triangular spot of pale buff. The ventral pattern is a wide, buffy-white shaft-stripe bordered irregularly with darker brown, with the margin of the feather pale buff.

As the head and neck are the last to lose the nestling down, so their first contour covering is correspondingly more advanced in colour and pattern than the mesoptile body feathers and hints strongly of the adult plumage. The facial area is but scantily covered with featherlets, the anterior crown is buffy, while the nape and neck show traces of the blue colour and white shafts of the adult. The latter is the first certain evidence of the male sex.

The full-grown juvenile tail-feathers are fourteen in number, and measure but 84 mm. in length as compared with 170 mm. in the adult. In shape they are slender, rather pointed and falcate, curving slightly outward and noticeably downward. In colour they are rufous-buff barred with dark brown.

The delayed 7th–10th primaries do not finish their growth until the body-moult into adult plumage is well on toward completion.

Half-grown Male of Two Months.—At this age the moult into the first winter or adult plumage is well marked. It starts at the neck and passes backward over the dorsal aspect of the body, changing the appearance of almost the entire upper surface before any of the lower plumage is affected. Much of the dorsal plumage is now of the fully adult or teleoptile type, both in colour and form, with the exception of the crest feathers, which are much shorter than they are destined to be in succeeding moults. Although the crimson colour is undoubtedly an extreme specialization, yet, curiously enough, this hue is always produced during the early growth of the buffy cephalic feathers, giving them crimson tips. The first teleoptile chin and throat plumage of the male is pure buff with but little admixture of crimson.

The rectrices are juvenile and full grown. The wing, however, at this age is in active moult. The mesoptile flights, which have served the young bird so well, have reached their limit of usefulness. The moult has begun in the centre of the wing and is proceeding both outward and inward. The innermost primary is new and has reached almost full length, No. 2 is an inch shorter, while No. 3 is not half grown. The remaining primaries are juvenile. The new feathers are darker, with little or no buff mottling, but the most conspicuous mark of distinction is the glistening white rhachis, contrasting strongly with the dull brown shafts of the early flights.

The outermost secondary, No. 1, as usual in this family of birds, is very short, hardly half the length of the adjoining primary and succeeding secondary, and, with No. 2, has not yet been shed. The moult of the secondaries has commenced with No. 3, and is proceeding inward. No. 3 is practically full grown, the sheath dying away from the umbilicus. Nos. 4, 5 and 6 are in active growth, measuring respectively beyond their blood-sheaths 106, 66 and 28 mm. From the 7th inward all are mesoptile.

The new median coverts are strikingly unlike their predecessors, replacing the dull, mottled buff and brown hues with the characteristic ventral pattern of a broad, greenish-white shaft-stripe, bordered with black, with blue-grey marginal halves of the webs.

Of considerable interest are the adventitious feathers which are found on birds of this age, appearing here and there, replacing those which have been accidentally tweaked out during some unusual stress in the life of a young bird. They are full grown and often somewhat worn, and are intermediate between juvenile and adult plumage. Pectoral ones show distinct traces of green, while an isolated upper tail-covert may be strongly tinged with crimson. A bird of this age measures in the wing, 159; bill from nostril, 8; tarsus, 41 mm.

Three-quarters grown Male.—In a bird of about ten weeks we find the most striking transition plumage. It has, indeed, a coat of many colours, especially as regards the ventral surface. While the change from the brown juvenile to the blue-grey adult dorsal plumage is comparatively quiet and harmonious, the acquisition of the adult lower plumage institutes the most striking contrasts of colour. In violent contrast to the pale, faded buff and black mottled juvenile feathers, there comes into view the green and crimson of the splendid adult Blood Partridge.

Simultaneously with the moult of the ventral surface occurs the assumption of the adult wing and tail feathers. The little narrow sickle flights and rudders of the nestling have served their turn well, and, although they have been used only a few weeks, show considerable wear. As regards the tail, the moult begins with the central pair of feathers, and proceeds very regularly and evenly outward: pair after pair falling out, each delaying its moult until the second preceding pair has reached almost a third of its full length. The rapidity of the moult diminishes when the second outer pair is reached, and the two remaining outer pairs of rectrices are retained for a considerable time. Even after the bird as a whole is clad in adult plumage these outer pairs often persist as short, brown, curved, covert-like feathers. The contrast between the old and new tail feathers is very striking, the former narrow, curved, mottled; the latter broad, blunt and clouded.

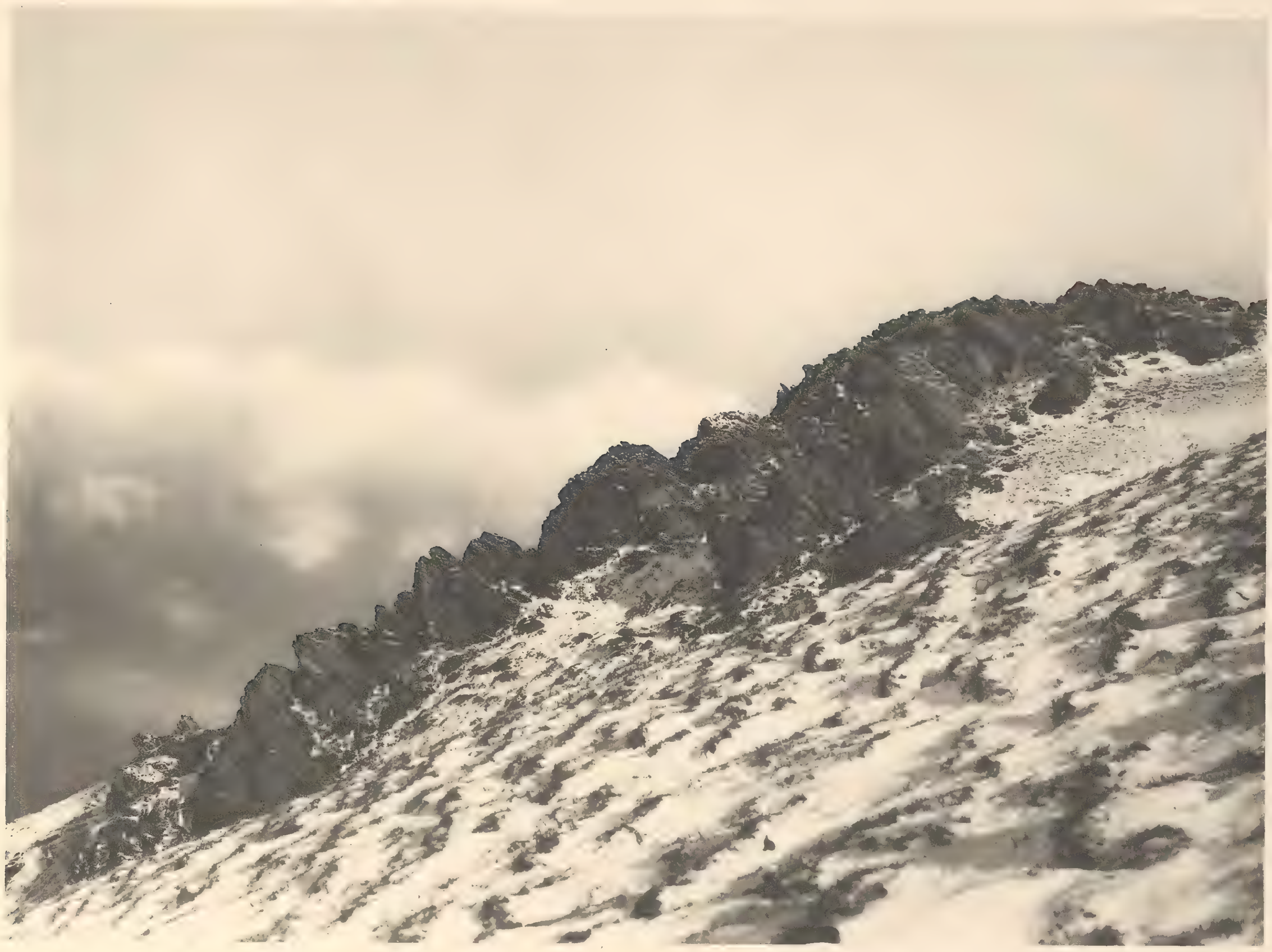
Nearly grown Male.—At first glance a bird of about three months or fourteen weeks appears fully adult, and, indeed, it is full grown as far as the plumage of the dorsal parts are concerned—crest, head, neck and body. The chin and throat have, however, only just begun to change, the warm buff of the juvenile being flecked here and there with rich crimson growing feathers. The ventral plumage is still growing, but shows no remaining juvenile feathers. In a bird of this age the wing moult is practically complete, the 7th primary, perhaps, still with its blood sheath, while the delayed 8–10th

PHOTOGRAVURE 2

SUMMER HOME OF THE SIKHIM HIMALAYAN BLOOD PARTRIDGE

THREE miles above the sea in the Himalayas the air is rarified, the sunlight is brilliant, the flowers masses of intense colour. The frost splits the rocks and the storms beat upon them with hail and scatter them piecemeal. In the alpine meadows only those low growths find foothold which are pliable and willing to bow before the blasts.

Tussocks of coarse tundra grass, slender lily stems, creeping juniper holding with knotted fingers to every crevice—these give the touch of life. And to this desolate zone come the Blood Partridges in spring, and here they nest among the shrubs in sheltered gullies, and search among the tussocks for seeds and insect life, or dust themselves in the rock débris on the leeward sunny side of the great jagged ridges.



SUMMER HOME OF THE SIKHIM BLOOD PARTRIDGE

primaries are at last full grown. The tail is clean moulted with the exception of the outermost pair, which clings so tenaciously to its follicles. The upper tail-coverts often show much immature patterning, indicative of their extremely early appearance in the moult. A typical young bird of this age shot in September or October, has the legs and feet pale vermilion; claws brown; iris dark brown; bill black, with the tip, edges, skin and nostrils and the orbital skin light red. Its measurements average: length, 415; wing, 190; tail, 127; bill from nostril, 9; tarsus, 64 mm. The small figures are due to the short growing feathers.

First Year Plumage.—As I have said before, the amount and intensity of the ventral crimson has nothing to do with age, and the young bird acquiring its first adult plumage in the autumn of the first year may have an abundance or show a complete lack of this colour on the under surface, according to whether it is in Nepal or southern Sikhim. When this moult is complete the male shows usually an excess of dark pigment, noticeable not only in the general darkening of the green, but also in the rectrices, which are in some cases almost wholly dark brown, with rather short crimson fringe.

The only certain way, however, of detecting a male bird of the year after its autumn moult is by the two or three outer primaries, which, appearing long after their fellows, are not moulted, and may be recognized by their dark or pale brown shaft instead of the white shining rhachis of the other flights. Another character is found in the spurs. These begin to be noticeable from August to November of the first year, during or after the autumn moult, appearing as rounded nodules, much as in the adult female. The total number of spurs make their appearance simultaneously during the first autumn and winter, whether this will prove to be two on each leg, as is usually the case, or, as rarely happens, the extreme of one on one leg and five on the other.

There is no seasonal change save what is due to wear. One finds traces of the regular autumn moult beginning in adult birdsas early as late July, and in August and September it is in full swing, varying, of course, according to the haunt and temperature. In October the last tail and flight feathers attain their full size, and the thick, soft plumage is ready for the stress of the oncoming Himalayan winter.

Development of the Female.—The change from the juvenile to the adult plumage in the case of the female is, of course, much less striking than the corresponding change in the male. The first year's teleoptile plumage of the female is characterized by somewhat coarser mottling of the feathers and a greater admixture of buff. I have examined a precocious individual which moulted very early, in which the juvenile broad shaft-stripe and mottling of the ventral plumage was retained, set off by the warm buff colour of the adult. The outer primaries are retained throughout the first winter and the following summer as in the male, but the absence of the white rhachis in the teleoptile plumage makes the fact more difficult of observation. Careful examination, however, shows very evident signs of increased wear, and a much duller gloss than in the other primaries.

Parasites.—Blood Partridges seem never to suffer from an excess of Mallophaga.

These are always present, however, and their eggs are sometimes very abundant, attached to the basal down of the lower throat feathers. From a male bird secured on the eastern boundary of Nepal I took two species of Mallophaga: *Goniocotes chrysocephalus* Giebel, and *Goniodes dissimilis* Nitzsch. The known galliformine hosts of these two species are as follows—

Goniodes dissimilis

Ithagenes cruentus
Syrmaticus soemerringi scintillans
Phasianus principalis
Phasianus torquatus
Gallus gallus
Gallus domesticus
Gallus sonnerati

Goniocotes chrysocephalus

Ithagenes cruentus
Gennaeus albicristatus
Gennaeus nycthemerus
Gennaeus andersoni
Lophura diardi
Lophura ignita
Phasianus colchicus
Syrmaticus soemerringi scintillans
Chrysolophus pictus
Argusianus argus

ITHAGENES CRUENTUS

Up to the present time we know of no specimen of Himalayan Blood Partridge east of extreme western Bhutan, save the single male *tibetanus* from Tawang, just east of Bhutan, which may prove to be of only subspecific rank. The next nearest forms to the eastward are *Ithagenes geoffroyi* in south-eastern Tibet and *kuseri* in the Mishmi Hills. It has been remarked more than once that the eastern or south-eastern specimens of *cruentus* differ appreciably from those ranging more to the west, chiefly in the larger amount of crimson streaking on the breast of the western or Nepal birds, this colour being usually absent or only faintly indicated on birds from southern Sikhim. This is well represented in the plates of Gould in his "Birds of Asia," and Elliot in his "Monograph of the Phasianidae." These differ more from one another than from the distinct species *geoffroyi*. Gould's bird is an extreme *cruentus;* that of Elliot being more nearly of the *affinis* type. About seventy per cent. of all Blood Partridges in museum collections are labelled either with no locality or with such uselessly vague terms as "India," the "Himalayas," or "Darjeeling." This species has never existed in the vicinity of Darjeeling, nor even in the Darjeeling district, and a number of the latter-named birds were doubtless collected far north on the Nepal slopes of the Singaleela Range, and so are typically highly coloured *cruentus*. Ignoring all such doubtful specimens, and after extended comparison of the specimens in many museums of India, Europe and America, I have admitted the following two forms—

NEPAL HIMALAYAN BLOOD PARTRIDGE

Ithagenes cruentus cruentus (Hardwicke)

Types.—In the British Museum. Localities: ♂ Nepal Hills; ♀ Valley of Nepal. Major-General Hardwicke.

Geographical Distribution.—Nepal, southern boundary of Tibet, northern native Sikhim.

Subspecific Characters.—Male: Pectoral crimson abundant and strong in tone, starting well up on the lower throat, and extending posteriorly as spots over more or less of the ventral plumage, sometimes even to the flanks. All the rectrices, save the single outer pair, tinged and fringed with crimson. Averages slightly smaller than *affinis*. Female: Warmer in tone than *affinis*. Some of the rectrices always tinged with crimson. Nepalese birds have a distinct crimson or deep rosy wash in the form of a band around the facial area, and a noticeable wash of the same colour on the chin and throat.

EARLY HISTORY

In 1822 Major-General T. Hardwicke, in the "Transactions of the Linnean Society of London," described the first known male specimen of the Himalayan Blood Partridge under the name of *Phasianus cruentus*. This bird is the typically, heavily crimsoned western form. Five years later, he gave the name *P. gardneri* to the female, under the impression that it was a wholly different species. Both specimens were obtained in Nepal, and of the female, the describer says that it came from "the snowy mountains north of the Valley of Nepaul." Hardwicke tells us that it was procured "through the zealous exertions of my friend Dr. Nathaniel Wallich, aided by the influence of the English Resident at Katmandoo (The Honourable Edward Gardner), without which no single article, of however little value, is obtainable by strangers from that jealous people the Nepaulese." It is remarkable that to-day, ninety years after this was written, conditions in Nepal remain quite the same.

The types of both male and female are now in the British Museum.

Ithagenes cruentus cruentus

Phasianus cruentus Hardwicke, Trans. Linn. Soc., XIII. 1822, p. 237.

Sanguine Pheasant Latham, Gen. Hist., VIII. 1823, p. 205.

Perdix cruenta Temminck, Pl. Col., V. 1825, pl. 31, no. 332; Lessing, Traité d'Orn., 1831, p. 504.

Phasianus gardneri Hardwicke, Trans. Linn. Soc., XV. 1827, p. 167.

Lophophorus gardneri Lessing, Man. d'Orn., II. 1828, p. 180.

Phasianus cruentatus Gray, in Griff. ed. Cuv., III. 1829, p. 47.

Perdix gardneri Gray, in Griff. ed. Cuv., III. 1829, p. 47.

Ithaginis cruentus Wagler, Isis, 1832, p. 1228; Gray, List of Birds, pt. III. 1844, Gall., p. 31; id. Gen. Birds, III. 1846, p. 504; Blyth, Cat. Mus. As. Soc., 1849, p. 241; Reichenbach, Handb. Speci. Orn., 1851, tab. XXVII; Gould, Birds of Asia, VII. 1851, p. 43 (*partim*), plate; Jerdon, Birds of India, III. 1863, p. 522 (*partim*); Gray, List Gallinae Brit. Mus., 1867, p. 46; id. Hand-list Birds, II. 1870, p. 264; Elliot, Mon. Phas., II. 1872, text (*partim*), plate; Hume & Marshall, Game Birds of India, I. 1878, p. 155, pl. (*partim*); Scully, Stray Feathers, VIII. 1879, p. 343; Bianchi, Annuaire du Mus. Zoo. l'Acad. Imp. Sci. St. Petersb., t. VIII. 1903, p. 1; Bianchi, translation of above, Journ. für Orn., LII. 1904, p. 70 (*partim*); Beebe, Zoologica, I. 1914, p. 266.

Perdix cruentatus Jardine, Nat. Lib. Orn., IV. 1834, p. 112.

Ithaginis cruentatus Hodgson, in Gray's Zool. Misc., 1844, p. 85; Gray, Cat. Hodgs., ed. I. 1846, p. 126.

Ithaginis cruentata Elwes, P.Z.S., 1873, p. 658.

Ithagenes cruentus Ogilvie-Grant, Cat. Birds Brit. Mus., XXII. 1893, p. 268 (*partim*); Ogilvie-Grant, Hand-book Game-birds, I. 1895, p. 215 (*partim*); Blanford, Faun. Brit. Ind. Birds, IV. 1898, p. 103 (*partim*); Evans, Camb. Nat. Hist., IX. Birds, 1899, p. 217 (*partim*); Dresser, Man. Palaearctic Birds, II. 1903, p. 675 (*partim*); Waddell, Lhasa and its Mysteries, 1906, p. 487; Walton, Ibis, (8), VI. 1906, p. 247 (*partim*); Brehm, Tierleben, Vögel, II. 1911, p. 84, pl. (*partim*); Seth-Smith, Avic. Mag., (3), II. 1911, p. 303; Baker, Bull. Brit. Orn. Club, XXXIII. 1913, p. 83; Baker, Ibis, 1915, p. 122; Baker, Jour. Bomb. Nat. His. Soc., XXIV. 1916, p. 389 (*partim*)

Ithaginis cruentus cruentus Beebe, Zoologica, I. 1912, p. 191.

Ithagenis (sic) *cruentus* Kellog & Paine, Records of Indian Museum, X. 1914, p. 229.

SIKHIM HIMALAYAN BLOOD PARTRIDGE

Ithagenes cruentus affinis Beebe

My attention was focussed on the lack of pectoral crimson and other distinctions characterizing the Blood Partridges of British Sikhim when examining scores of specimens in various museums, and I found that I could usually separate the two forms at a glance. Looking at a large series of skins from Nepal and northern native Sikhim, the eye at once notes three distinct zones of crimson on the ventral surface; chin, midbreast and under tail-coverts. In a second series of birds collected in British Sikhim the central zone is almost or wholly absent.

TYPE LOCALITY.—Near Nathang, 12,000 feet elevation.

GEOGRAPHICAL DISTRIBUTION.—The higher ridges of British Sikhim.

SUBSPECIFIC CHARACTERS.—Male: Pectoral crimson absent from visible portions of feathers or represented by a few rusty stains or at most several scattered spots. The two outer pairs of rectrices always without a tinge of crimson. Averaging slightly larger than *cruentus*. Female: Greyer in general tone than the western form, especially on the lesser wing-coverts and tertials where the lighter markings are decidedly whitish instead of warm buff. Only ten per cent. or less of Sikhim birds (and these doubtfully labelled specimens) show even the faintest trace of a crimson tinge around the facial area or on chin, throat and rectrices.

EARLY HISTORY

On August 17, 1912, I published the diagnosis of *affinis* in "Zoologica," designating as types, male, No. 387, and female, No. 450 in the Kuser-Beebe Collection. Both were secured at 12,000 feet elevation near Nathang, British Sikhim. These types have been presented to the American Museum, New York City.

Ithagenes cruentus cruentus

Perdix cruentatus Jardine, Nat. Lib., Orn., IV. 1834, pl. VII.

Ithaginis cruentus Gould, Birds, Asia, VII. 1851, p. 43 (*partim*); Jerdon, Birds, India, III. 1863, p. 522 (*partim*); Elliot, Mon. Phas., II. 1872, text (*partim*), plate; Hume, Game-birds, India, I. 1878, p. 155, pl. (*partim*); Bianchi, Annuaire du Mus. Zoo. l'Acad. Imp. Sci. St. Petersb., VIII. 1903 (*partim*); Bianchi, translation of above, Jour. für Orn., LII. 1904, p. 70 (*partim*).

Ithagenes cruentus Ogilvie-Grant, Cat. Birds. Brit. Mus., XXII. 1893, p. 268 (*partim*); Ogilvie-Grant, Handbook Game-birds, I. 1895, p. 215 (*partim*); Blanford, Faun. Brit. Ind. Birds, IV. 1898, p. 103 (*partim*); Evans, Camb. Nat. Hist., IX. Birds, 1899, p. 217 (*partim*); Dresser, Man. Palaearctic Birds, II. 1903, p. 675 (*partim*); Walton, Ibis, (8), VI. 1906, p. 247 (*partim*); Brehm, Tierleben, Vögel, II. 1911, p. 84, pl. (*partim*); Bailey, Jour. Bomb. Nat. His. Soc., XXI. 1911, p. 178; Baker, Jour. Bomb. Nat. His. Soc., XXIV. 1916, p. 389 (*partim*).

Ithaginis cruentus affinis Beebe, Zoologica, I. No. 10, 1912, p. 191; Beebe, Zoologica, I. No. 15, 1914, p. 265.

Ithagenes cruentus affinis Baker, Ibis, 1915, p. 122.

TIBETAN BLOOD PARTRIDGE

Ithagenes tibetanus Baker

NAME.—Specific: *tibetanus,* from the locality of the type specimen.

TYPE.—"The Sela Range, above Tawang, south-east Tibet," Baker, Bull. Brit. Orn. Club, XXXV. 1914, p. 18. The type is in the Museum of the Bombay Natural History Society.

GENERAL ACCOUNT

THIS Blood Partridge is known from only a single male specimen collected by Captain Molesworth, who reports that he saw a number of others. It was secured at a high elevation in Tibetan territory just east of Bhutan. How far it ranges westward toward the Himalayan species, or eastward toward the haunts of Kuser's Blood Partridge we do not know. We are also ignorant of its status, whether it is in reality a good species or whether it grades into any other form.

The Tibetan bird is described by Mr. Baker as differing from *cruentus* in having the lores and superciliaries crimson instead of black and in having no black line under the eye; the posterior ear-coverts are grey and white, and not black and white. There is much more crimson on the breast than in the birds to the west, and the flanks and lower breast are almost wholly grey, the green being reduced to narrow stripes. There is also less green on the wings. The crimson hue of the feathers of the throat extends quite to the base, and is not, as in *cruentus,* confined to the visible portions of the web.

From Kuser's Blood Partridge the Tibetan bird differs in the paleness of the ventral plumage, the crimson being confined to the breast and not extending to the throat and fore-neck. The lores are crimson instead of black, and the superciliary streak is wholly crimson and not partly black. The black gorget instead, as in *kuseri,* of extending from the top of the ear-coverts completely around the throat, is present only to the extent of a few dark grey markings on the throat. In size this bird agrees with both *cruentus* and *kuseri.*

Ithagenes tibetanus Baker, Bull. Brit. Orn. Club, XXXV. 1914, p. 18; Baker, Ibis, 1915, p. 122; Baker, Jour. Bomb. Nat. His. Soc., XXIV. 1916, p. 399.

HOME OF THE NORTHERN BLOOD PARTRIDGE

An alpine feeding ground of Blood Partridges in the autumn. When the snow melts on the Nanshan Mountains in north central China a dense growth of plants springs up, and in midsummer these meadows are ablaze with colour. The Blood Partridges nest among the blossoms and pluck the buds and scratch up the shallow-rooted plants for grubs. As autumn approaches, the petals fall and the meadows become covered with a myriad seed cases, hard-seeded berries, and fluffy-topped everlastings. Then the Partridges pass back and forth with their broods, brushing off the filmy seeds, restless and ever ready at the first blackening frost to retreat to lower levels.

HOME OF KUSER'S BLOOD PARTRIDGE

In northern Yunnan, the winds from the snows find their way over the passes along narrow paths. On either hand, rugged oaks and pines are able to keep a roothold, but in the sweep of the icy blast nothing can grow but low, stunted bamboos and coarse grass. The Blood Partridges live at these altitudes, roost among the trees, but find their food in the flower-dotted expanses of the close-cropped upland meadows.

HOME OF THE NORTHERN AND OF KUSER'S BLOOD PARTRIDGE

KUSER'S BLOOD PARTRIDGE

Ithagenes kuseri Beebe

NAME.—Specific: *kuseri* after Col. Anthony R. Kuser of Bernardsville, New Jersey.

TYPE.—"Vicinity of Tsekon, Yunnan," Beebe, Zoologica, I. 1912, p. 190. The type is in the Musée Nationale d'Histoire Naturelle in Paris.

GEOGRAPHICAL DISTRIBUTION.—North-western finger of Yunnan, and westward to the Mishmi Hills.

GENERAL ACCOUNT

ONE day, in December 1910, in north-western Yunnan, I noticed a Chinaman passing along the trail driving a number of forlorn horses with some heavy merchandise. Under the thongs which fastened one of these loads was tucked a bedraggled mass of feathers. A glint of scarlet caught my eye, and I stopped the man and examined the plumage. I saw at once that it was the remains of a Blood Pheasant, and consisted of a large patch of breast feathers almost wholly scarlet and black, and two detached wings with the typically long, loose, bright green coverts of *geoffroyi*. I secured the plumage and learned that the man had obtained it from a native farther to the north. He could not say certainly whether all the plumage came from a single individual, and although I realized its great interest, it was impossible to put any exact interpretation upon it at the time.

A year and a half later, while studying the specimens of pheasants in the museum of the *Jardin des Plantes* in Paris, I came across two mounted specimens which cleared up the matter and showed that the Blood Partridge from the extreme north-west finger of Yunnan is a very well-marked form, by far the most beautiful and brilliantly coloured of its genus. Lacking any data as to intermediate specimens I afforded it full specific rank.

Confirmation of this decision and an extension of the range of Kuser's Blood Partridge was made possible by Captain F. W. Bailey, who found the species far to the westward of my locality in the Mishmi Hills, between eight and twelve thousand feet elevation. Altogether ten additional specimens have been secured, seven males and three females. All of these sustain the validity of the characters upon which I based the species. Three eggs have also been obtained, quite similar to those of *geoffroyi*. They were found at twelve thousand feet in early May, laid on the bare ground under a clump of bamboo, with snow close by.

I have taken great pleasure in naming this beautiful Blood Partridge in honour of Colonel Anthony R. Kuser, whose interest and generosity have made possible these researches.

DETAILED DESCRIPTION.—Male: entire forehead, chin, throat and sides of the head crimson. A narrow collar of black feathers with crimson fringes crosses the upper breast, merging at the sides with the blue-grey of the mantle. Posteriorly the breast, upper belly and corresponding sides of the body are intense crimson, marked only with very narrow shaft-lines of pale green. Behind this area the lower belly and sides down to the thigh, are brilliant, clear apple green.

The whole head is chiefly black, with no white or cream colour except a trace on the nape. The upper body plumage is uniform blue-grey, with conspicuous shaft-stripes, white without any tinge of green. The wing-coverts are bright, clear green throughout, and the middle and greater coverts are very long, with recurved, decomposed barbs. Black is wholly lacking on the visible portion of these coverts, the only character being the slightly paler green shaft-stripe. The concealed bases show a rufous-brown tinge, while still more basally the feather becomes blue-grey with the narrow black lines bordering the shaft. The covert and tail fringes of crimson are well developed and the under tail-coverts are brilliant crimson.

The description is of the specimen designated as the type and is a fully adult male bird, No. 179A in the mounted collection of the Musée Nationale d'Histoire Naturelle. It is marked "Yunnan. Prince H. d'Orleans, 1896."

Measurements of this specimen are: culmen, 12; wing, 215; tail, 132; tarsus, 64; middle toe and claw, 53 mm. There are two spurs on the right leg and a single one on the left, each about half an inch in length. The specimen is considerably moth-eaten and in a bad state of preservation.

A second specimen of *Ithagenes kuseri* is No. 179B in the same collection. It is a young bird in its first year, the spurs being mere flat nodules. It corresponds in all respects with the type, except that there is an even greater infusion of black throughout the plumage. The tail, which is more perfect than in the other bird, is somewhat longer. Its label gives "Tsékon, Yunnan. R. P. Soulie, 1897." This locality is in the north-western finger of Yunnan, on the Mekong River, in latitude 28° north and longitude about 99° east, thus giving a definite location for the species.

Since naming this species Mr. Eagle Clarke has been kind enough to send me a rather young male *Ithagenes* in full moult, which bore the locality "Yunnan" on the label. Upon careful examination I came to the conclusion that it was undoubtedly *kuseri*, but an abnormal individual. In no species of this genus is there normally an increase in pectoral scarlet after the first post-juvenile moult, but in two or three individuals I have found an abnormal condition of pigmentation in young birds, and this seems another; the degenerate rusty-buff pigment stains on the pectoral plumage being replaced by crimson in the feathers of the succeeding moult.

This bird is a male in exceedingly worn plumage undergoing the autumn moult of the second year. The throat and breast are a mixture of buff and blue-grey, with numerous half-concealed spots of crimson on the new growing feathers. Half the primaries have been shed, while the tail shows some mutilation, only two right rectrices remaining. Through ill nourishment or some other cause, the bird entered its post-juvenile moult with very impure coloration and is apparently partly regaining the normal colours in the present moult. Two young male birds from Nepal which I have examined show the same thing, an excess of buff in place of the crimson.

Kuser's Blood Partridge combines some of the characters of *cruentus* with the brilliant green patch of *geoffroyi*, but it differs in many ways from both. From

Himalayan birds it at once stands apart as almost lacking the white or cream colour on the anterior part of the body, in the solid black gorget on face and neck, in the remarkable amount of crimson, and in the *geoffroyi* type of wing.

The female of Kuser's Blood Partridge differs from that of *cruentus* in being of a general darker colour. The rufous in the western bird is replaced by brown, and the breast, instead of being plain rusty-brown or rufous, is vermiculated with brown and buff. The slate colour of the head and nape is much darker, almost black, and the chestnut of the forehead and sides of the head is much richer and deeper.

Captain Bailey has gathered a number of notes on the habits of this species, published both by himself and by Mr. Baker, from which I excerpt the following. These birds are most extraordinarily common in certain parts of the country we visited, keeping close to the snowline, and apparently moving up and down between eight thousand and fourteen thousand feet as the snow increased or receded. They are often found in deep snow. Once when I was snowed up for several days, these birds came round my tent. They go about in flocks of from ten to twenty, and they fly very unwillingly, and when forced to take wing, settle again almost immediately and take to their legs. They are never found in the open but always in fairly deep forest.

The Mishmis trap them by building a light fence made of twigs about eighteen inches in height, usually along a contour of the hill in the forest. In this, gates are kept open just wide enough to admit a bird, and in these openings a noose is placed, made of fine roots and fixed to a bent, springy bamboo. The birds, when feeding, wander down to the fence and do not hop or fly over, but follow it until they reach one of the gates, and the first bird to pass is usually caught.

Another writer says that while Kuser's Blood Partridge is usually found in bamboo jungle close to the snowline, in early morning and late evenings they come out into the open. When there was snow on the ground they were very conspicuous. They would make no attempt to move until fired at, and even then would often settle almost within gunshot. While usually in flocks of about a dozen, they would sometimes be seen in parties of as many as forty. They fed on seeds and vegetable matter mixed with insects.

Ithaginis kuseri Beebe, Zoologica, I. 1912, p. 190.
Ithagenes cruentus kuseri Baker, Bull. Brit. Orn. Club, XXXIII. 1913, p. 83.
Ithagenes kuseri Baker, Bull. Brit. Orn. Club, XXXV. 1914, p. 18 ; Baker, Ibis, 1915, p. 122 ; Baker, Jour. Bomb. Nat. His. Soc., XXIV. 1916, p. 395.

GEOFFROY'S BLOOD PARTRIDGE

Ithagenes geoffroyi Verreaux

Names.—Specific: *geoffroyi*, named after M. Alfred Geoffroy St.-Hilaire, the eminent French zoologist. English: Geoffroy's or Grey-necked Blood Partridge. French: Francolin Geoffroy. German: Chinesischer Blutfasan. Vernacular: Semo, Tsiri (Tibetan); Tsong-ky (bush-hen, Chinese); Sung Chi-i (spruce-hen, Chinese).

Brief Description.—Male: Bluish-grey above, with white shaft-streaks, edged with black; wing-coverts intense green; green below, with grey chin, throat and chest, crimson under tail-coverts. Female: Greyish-brown above and below, mottled below with blackish-brown; forehead, face, chin and throat brownish.

Type.—Both male and female are from the mountains of Moupin, western Szechuan, China. Verreaux, Bull. Soc. d'Acclim., (2), IV. 1867, p. 706. Both types are in the British Museum.

GENERAL DISTRIBUTION

The knowledge which we have of the range of this species shows that it inhabits the higher altitudes of the eastern Himalayas of south-eastern Tibet, as well as northern Aborland, western Szechuan, and extreme northern Yunnan. All the record localities may be included in a rather long rectangle between the points 92° and 102° east longitude, and 29° and 31° north latitude. Much of this area is "forbidden land," and not until the fierce tribes dwelling therein have been subjugated can we hope to learn more concerning the exact distribution of this bird. Somewhere in eastern Bhutan, or in the still unexplored Aborland to the eastward, *geoffroyi* and *tibetanus* probably meet.

Although, geographically, the eastern half of the haunts of Geoffroy's Blood Partridge is in Chinese territory, yet the character of the fauna and flora is essentially south Tibetan and Himalayan. The general character of the country at various altitudes, which I observed in northern Yunnan, holds good, according to Ward and others, over much of the western Szechuan region. Here among this maze of mountains, breaking the fall from the Tibetan tableland to the plains of east and south China, a number of great rivers flow almost parallel to one another. They draw their headwaters from that great mountain range of mystery the Kokonor itself, and have cut for themselves deep, wild gorges and canyons through the highlands. The lammergeier which soars ever so little above the mountain tops, sees, directly beneath, waters which will flow a thousand miles to the east, and in an adjoining valley those which will find their way sixteen hundred miles to the south, into the same warm sea which washes the tropical coasts of Borneo. On the mountains between these rivers lives this Blood Partridge. Here it ranges from about ten to sixteen thousand feet, and, owing to the more broken, irregular character of the country, its haunts are infinitely varied, especially as to flora.

GENERAL ACCOUNT

The altitudinal movements of Geoffroy's Blood Partridge are the result of a search for food, and while on exposed slopes this may necessitate their ascending or

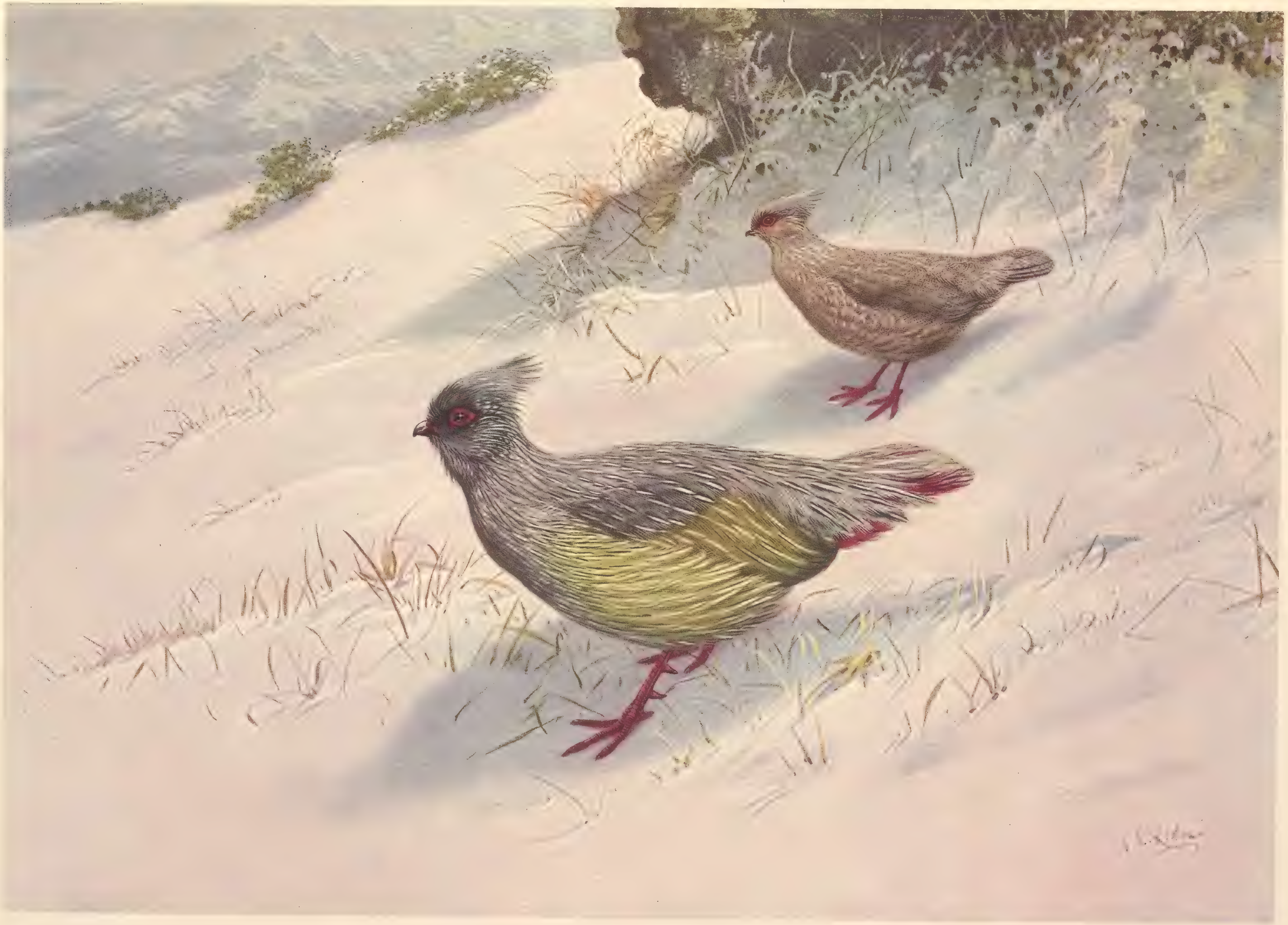
PLATE V

GEOFFROY'S BLOOD PARTRIDGE

Ithagenes geoffroyi Verreaux

Still dominated by the majesty of Kinchinjunga, although from a wholly new angle, we find this species of Blood Partridge among the snowy uplands of Eastern Tibet. In pairs, or usually in small-sized flocks, they glean a livelihood among the cold-stunted vegetation of the alpine meadows. The nine birds which I saw together had their pleasing grey and emerald plumage set off by a mass of blossoms which only the brief summers of these altitudes can bring forth—white anemones, yellow saxifrage, and blue gentians that matched the sky above the distant snow peaks.

PLATE V



GEOFFROY'S BLOOD PARTRIDGE.

descending many thousand feet annually, on a more sheltered range they will remain the entire year with much less of seasonal movement.

The gorgeousness of the cold-temperate and semi-alpine flora of the eastern Himalayas is fully equalled in Szechuan—splendid forests overhead, shrubs giving forth the sweetest of scents, and banks of flowers carpeting the mossy ground.

The favourite altitude of these partridges, from twelve to fifteen thousand feet, includes, as in the Himalayas, the firs and larches and oaks, these giving place to rhododendrons, trees at first, but higher up dwarfing to shrubs, and passing into the alpine meadows and grasses at a height of about three miles above the sea. At the higher levels of the Blood Partridge's home we find wonderfully brilliant alpine flowers—primroses, both crimson and blue—sometimes so numerous as to form almost a mosaic of solid colour; yellow saxifrage, white, nodding anemones and gentians as blue as the snow-contrasted sky overhead.

The brief glimpse I had of these birds—nine altogether—told me nothing of their habits, but from the accounts of David, Davies, and from manuscript notes given me by French missionaries and sportsmen, we may be certain that their habits are identical with those of the Himalayan birds.

They have the same sociable traits and, at other than the breeding season, unite in coveys or flocks of from ten to thirty individuals, and, indeed, large troops of the birds are occasionally to be seen. Even before the young are full grown these coveys are formed, and I have known of three adult birds and six only half-grown young to be shot from a flock of not less than thirty-five. The birds thus appear to find that there is safety in such association, and the families probably begin to drift together soon after the young are able to fly up to perches. It is certainly true that most of the "hunted" mammals of these high, rugged regions spend much of their lives in flocks or herds, such as the wild sheep, the markhor, tahr, goral, and other goats. The dhole, or wild dog, is the only one of the "hunters" which appears to go in packs. There is a distinct parallel between the pheasants and herbivorous mammals of these high altitudes and those of the tropical jungles, where both deer and pheasants keep to single families and where parents and young soon separate.

In country where bamboo is abundant the birds seem to show a partiality for its shelter, roosting, however, by preference in trees—firs or rhododendrons. When living and feeding among spruces the birds are said to be almost inedible.

They have the typically Ithagenine habit of disinclination to flight, combined with considerable running power. It would seem as if they had learned to fear danger in the air far more than pursuit on the ground. It is likely, indeed, that, on the whole, the sudden swoop of an eagle or spring of a leopard or fox is more disastrous than the long-continued pursuit of any four-footed enemies. Hence swift, dodging speed, around boulders and tussocks, would be the safest escape to the shelter of the dense rhododendrons or bamboos. When alarmed into flight the covey fans out at once, the birds scaling for some distance and alighting in various directions, then later reassembling by call. A dog will always send the birds into trees, from which they pay little attention to an approaching human being.

The call of this bird, which I did not myself hear, is described as a single long-drawn-out, wheezy whistle, followed by several sharper notes. Another correspondent gives it as a loud, long-continued squealing.

I found the birds scratching among dwarf bamboo, probably both for insects and seeds. David gives buds, leaves, and grains as their diet, while the crops of three birds shot in April in the snow contained nothing but moss.

A single nest of Geoffroy's Blood Partridge has been found a short distance to the west of Tachienlu in west-central Szechuan (30° north latitude and 102° west longitude). This was on the ground, under brushwood in the forest, at thirteen thousand five hundred feet elevation, and contained seven beautifully marked eggs. These are of a narrow, elongated oval shape, smooth and almost glossy, with a ground colour of pale reddish-buff, blotched irregularly, but over the entire surface, with several shades, the darkest being a deep reddish-brown. In shape and pigmentation these eggs are far more Charadriiform or Lariform than like any of the eggs of true pheasants. Of Galliformine birds they resemble most closely the eggs of ptarmigan or black grouse. These eggs measure from 47·1 to 52·2 mm. in length, and from 31·8 to 33·1 mm. in breadth.

The Tibetans seldom trap these birds, but the Chinese have of recent years created a demand for them along with all other birds of an edible nature, and with their continued migration into this western region, the bird will doubtless soon become even more rare than it is at present. The extremely isolated character of many of the steep slopes and almost impassable nature of much of this wild country will, however, give it a good chance for existence for many years to come.

The only record of Geoffroy's Blood Partridge in captivity is a bird received at the London Zoological Gardens on July 19, 1875, which lived over a year, until September 19, 1876—a record lease of life in captivity for birds of this genus.

Detailed Description.—Adult male: forehead and feathers around bare facial area black. Very long and loose green feathers blue-grey. Ear-coverts elongated, narrow and loosely webbed; black with distinct white shaft-streak. From the nape backward to the tail-coverts, blue-grey. What on the nape is at first only a whitened rhachis, widens posteriorly into a broad shaft-streak, becoming broadly bordered with black on the back. Lesser wing-coverts like back. Middle and greater coverts intense apple green, elongated and loosely webbed, with shaft-streak of paler green. Inner secondaries greenish, the succeeding few blue-grey and the remainder, together with the primaries, brown with glistening white shafts.

Rectrices uniform pale, ashy-blue, all but the outer pair, together with the upper and under coverts with a long, lateral, crimson fringe of disintegrated barbs. On the under coverts the crimson frequently occupies almost the entire feather.

The chin is blackish, rapidly paling into the uniform blue-grey of the throat and breast. Beginning in a straight transverse line across the lower breast, a patch of brilliant apple green covers the sides and mid-belly, giving place posteriorly to the dense, blue-grey, wholly disintegrated belly and vent plumage. A few specimens show buffy stains on the margins of some of the breast feathers. The average number of spurs is two on each leg; this holding good for six out of seven specimens. The remainder have a single spur on either the right or left leg. The iris is hazel, bill black, with the base, nostrils and bare orbital skin red, feet and spurs coral red, claws brown.

Measurements: bill from nostril, 11; wing, 208–223 (215); tail, 165–190 (177); tarsus, 64; middle toe and claw, 56 mm.

Adult female: forehead, sides of the head, chin and throat buffy brown, many of the feathers, except on the last two regions, bordered with darker. Long, loose crest clear blue-grey as in the male. Ear-coverts elongated and darkish-brown with pale shafts. Nape, neck all around, the upper mantle clear blue-grey.

The body plumage, above and below, shows a uniform vermiculation of cold grey and dark brown, equal in amount above, while below, the slight predominance of the grey gives a somewhat paler tone. This is still more true of the upper tail-coverts, which are distinctly ashy. The wing-coverts like the back. Scapulars and rectrices are rather more coarsely vermiculated. Primaries dull brown, paler on the outer web. The majority of individuals show a distinct crimsoning of the lateral margins of the rectrices. Measurements: bill from nostril, 10; wing, 210; tail, 162; tarsus, 61; middle toe and claw, 56 mm.

Natal Down.—Similar to *I. cruentus*, except that the plumage is somewhat colder in general tone, and the dark hues are chocolate rather than rufous. The chin, throat and superciliaries which extend to the hind neck as two broad nuchal bands, are greyish-white or ashy.

Juvenile Plumage.—The under parts are dull mottled brown with broad, noded, pale buff shaft-stripes especially conspicuous on the breast. The upper plumage is still darker brown, vermiculated with buff. All the feathers are triangularly tipped with buff, and the secondaries have in addition four or five broken transverse bands of the same colour most distinctly developed on the outer webs. The juvenile rectrices show considerable white mottling. A bird of three weeks measures: bill from nostril, 5; wing, 93; tail, 46; tarsus, 32; middle toe and claw, 28 mm.

Half-grown Male.—In a bird of about two months, the first autumn moult is in full swing, the new adult plumage showing on the dorsal surface of the head, neck, shoulders, mantle and inner wing feathers. In all of this area there is considerable infusion of dark pigment, with corresponding reduction of the blue-grey. Except for a few inner, middle wing-coverts the wings externally are wholly juvenile. The delayed outer primaries are in full growth, the 9th measuring 46, and the 10th primary 23 mm. beyond their sheaths. Their white rhachis shows conspicuously compared with the brown juvenile shafts. The juvenile primaries are much worn. Nos. 1 and 2 are of the new plumage, measuring 31 and 5 mm. respectively. The tail is more advanced than the wings, and has reached the period of temporary rest when all the feathers have been shed save the two outer pairs of juveniles. These are of the usual curved and pointed shape, dark brown, mottled irregularly with pale buff, especially on the outer web, and with warmer buff at the tip. The new feathers, while nicely graduated from within outward, show the rapidity of their moult by the fact that even the crested ones are still shorter than the outer juveniles. They are greyish white, clouded with white at the tip, those of most recent growth (the 4th and 5th pairs) showing clearer webs. The inner ones have well-marked, pale crimson fringes. The male under discussion measures: bill from nostril, 7; wing, 116; tail, 66; tarsus, 40; middle toe and claw, 30 mm.

EARLY HISTORY AND SYNONYMY

The first specimens, both male and female, ever obtained of this species were procured by a French missionary, Père Chauveau, in the mountains near Tatsienlu, Szechuan, and sent to Paris in the year 1866 by M. Dabry, French Consul at Hankow. These were included in a remarkable collection of birds, containing not only four males and a female of this new Blood Partridge, but a pair of the equally unknown L'Huys Impeyan, and the first living Temminck's Tragopans which ever reached the continent of Europe. The Blood Partridges were sent to the Société Nationale d'Acclimatation de France, where M. Jules P. Verreaux named them in honour of M. Albert Geoffroy St.-Hilaire.

SYNONYMY

Ithaginis geoffroyi Verreaux, Bull. Soc. d'Acclim., (2), IV. 1867, p. 706; Gray, Hand-list, II. 1870, p. 264; Sclater, Ibis, (2), VI. 1870, p. 297; David, N. Arch. Mus. d'hist. nat., VII. 1871, p. 11, No. 358; Swinhoe, Proc. Zool. Soc., 1871, p. 400; Sclater, Ibis, (3), IV. 1874, p. 169; David & Oustalet, Ois. Chine, 1877, p. 401, pl. 113; Oustalet, Naturaliste, 1886, p. 276; Seebohm, Ibis, (6), III. 1891, p. 381; Oustalet, Ann. Sci. Nat. Zool., (7), XII. 1892, p. 313; Seebohm, in Bower's Diary of Jour. across Tibet, 1894, p. 297; Oustalet, Nouv. Arch. Mus. Paris, (3), VI. 1894, p. 77; Beddard, Struct. and Class. Birds, 1898, p. 293; Bianchi, Annuaire du Mus. Zoo. l'Acad. Imp. Sci. St. Petersb., t. VIII. 1903, p. 1; Bianchi, trans. of above, Jour. für. Orn., LII. 1904, p. 70; Beebe, Zoologica, I. 1914, p. 265.

Ithaginis geoffroyii Gould, Birds Asia, VII. 1872, pl. 42; Elliot, Mon. Phas., II. 1872, pl. 31.

Ithaginis geoffroii Garrod, Proc. Zool. Soc., 1879, p. 359.

Ithagenes geoffroyi Ogilvie-Grant, Cat. Birds, Brit. Mus., XXII. 1893, p. 269; Ogilvie-Grant, Hand-book, Game-Birds, I. 1895, p. 218; Sharpe, Hand-List Birds, I. 1899, p. 33; Davies, Ibis, (8), I. 1901, p. 408; Oates, Cat. Eggs Brit. Mus., I. 1901, p. 50; Dresser, Man. Palæ. Birds, II. 1903, p. 676; Wilson, A Naturalist in Western China, II. 1914, p. 118; Baker, Ibis, 1915, p. 122; Baker, Jour. Bomb. Nat. His. Soc., XXIV. 1916, p. 400.

WILSON'S BLOOD PARTRIDGE

Ithagenes wilsoni Thayer and Bangs

Names.—Specific: *wilsoni*, after E. H. Wilson, connected with the expedition on which this species was discovered; English: Wilson's Blood Partridge.

Brief Description.—Male: Similar to Geoffroy's Blood Partridge, but about one-third smaller. Female unknown.

Type.—"Washan Mountain, Western Szechuan," Thayer and Bangs, Mem. Mus. Comp. Zool. Harvard, XL. 1912, p. 139. In Museum of Comparative Zoology, Harvard.

Range.—Mount Wa, in south-central Szechuan.

GENERAL ACCOUNT

This species is based upon two adult male birds, which were collected in November 1908, by an expedition sent out by Harvard University. They were secured at an elevation of nine thousand feet, in the range of mountains known as Washan.

This is more properly an irregular mountainous elevation culminating in one peak, Mount Wa. This peculiarly shaped mountain has been described by Mr. Baker. "The upper storey of this most imposing mountain is a series of twelve or fourteen precipices rising one above another, each not much less than two hundred feet high, and receding very slightly on all four sides from the one next below it. Every individual precipice is regularly continued all around the four sides. Or it may be considered as a flight of thirteen steps, each one hundred and eighty feet high and thirty feet broad. Or, again, it may be described as thirteen layers of square, or slightly oblong, limestone slabs, one hundred and eighty feet thick and about a mile on each side, piled with careful regularity and exact leveling upon a base eight thousand feet high. Or perhaps it may be compared to a cubic crystal stuck amid a row of irregular gems. Or perhaps it is beyond compare."

The mountain is heavily forested, and in many places covered with short, scrubby bamboo. It is said to be quite isolated, and is situated in a bend of the Tung River, which, some distance higher up, swings to the northward and passes to the east of Tatsienlu, the most easterly record for Geoffroy's Blood Partridge. In view of the fact that most of the peculiar mammals and birds secured on this same expedition came from the Washan, it seems reasonable to assume that these two dwarf, adult male Blood Partridges actually represent an isolated species. That they are adult is attested by the size of the spurs, of which both individuals have two on each leg, of full adult length. The cere and eye-ring are noted as deep orange red, and the tarsi as coral red.

When compared with a large series of *geoffroyi*, there are no colour characters which separate the two forms, but the following measurements show the very considerable difference in size—

	Culmen from nostril.	Wing.	Tail.	Tarsus.	Middle toe and claw.
Ithagenes wilsoni	12	170	126	56	49 mm.
Ithagenes geoffroyi	14	215	177	64	56 mm.

While admitting *wilsoni* as a valid species in the light of our present knowledge, it is important to record the fact that the *geoffroyi* from the western part of their range are appreciably larger in size than those from Tatsienlu and its vicinity.

Ithagenes wilsoni Thayer and Bangs, Mem. Museum Comp. Zool. Harvard, XL. 1912, p. 139; Wilson, A Naturalist in Western China, II. 1914, p. 119.

Ithaginis wilsoni Beebe, Zoologica, I. 1914, p. 265.

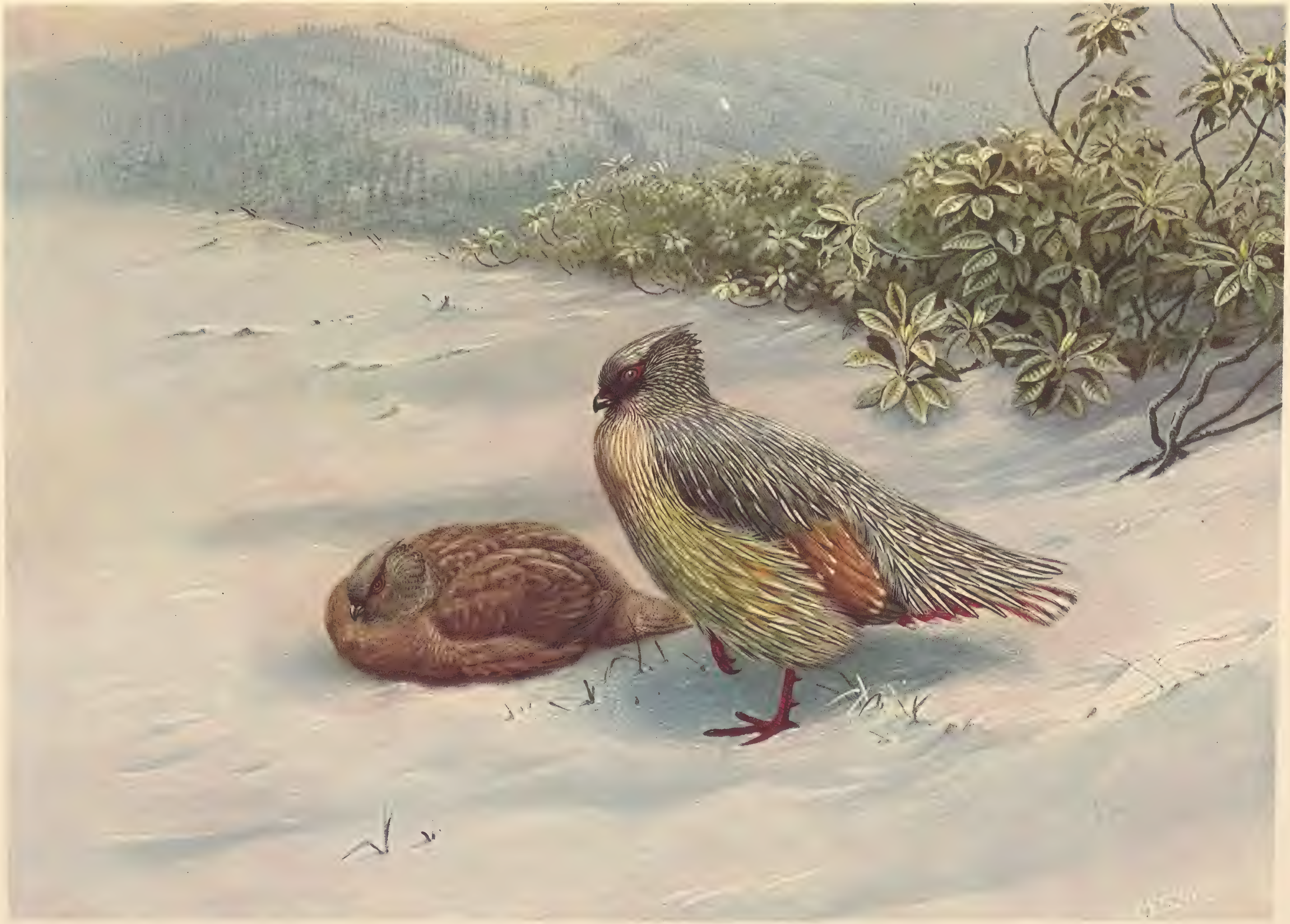
PLATE VI

NORTHERN BLOOD PARTRIDGE

Ithagenes sinensis David

Five hundred miles north of the Himalayas, on the alpine slopes of the Nanshan ranges, lives the Northern Blood Partridge. The Chinese call it Song-hoa-ky, the flower bird of the firs; and its soft pastel crimson, emerald russet and grey merit well the name. They spend their life among low firs, among thickets of stunted willows and mountain ash. Few white men have seen them, but the Chinese hunters find their coveys easy to approach, for they know little of mankind and fear only the eagles and foxes and leopards which are ever on the lookout for them.

PLATE VI



NORTHERN BLOOD PARTRIDGE.

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David's Northern Blood Partridge	*Ithagenes sinensis sinensis* David.
Michael's Northern Blood Partridge . . .	„ „ *michaëlis* Bianchi.
Berezowsky's Northern Blood Partridge . . .	„ „ *berezowskii* Bianchi.

This species has been separated into three subspecies, but the habits of these, so far as we know, are so similar, that I shall treat of them under the species-heading, except as to synonymy and subspecific description.

Names.—Specific: *sinensis*, of China; *michaëlis*, for the collector, Michael Efimovitsch Grum-Grzimailo; *berezowskii*, for the Russian zoologist, M. M. Berezowsky; Vernacular: Hoa-ky (flower-bird); Song-hoa-ky (flower-bird of the firs, Chinese); Sermun (Mongol).

Brief Description.—Male: Bluish-grey above, with white or greenish-white shaft-streaks; wing-coverts golden or cinnamon; crest ashy-grey; throat and breast buff; lower breast and sides apple green; under tail-coverts crimson. Female: Head ashy; upper parts greyish buff; under parts brownish buff.

Range.—Higher regions of Kansu, Shensi and northern Szechuan.

GENERAL DISTRIBUTION OF THE SPECIES

The Northern Blood Partridge inhabits the subalpine slopes of the mountains of central China, the eastern Nanshan Mountains in Kansu, and eastward along the highlands of the Hoang-ho River, through central and southern Shensi in the Tsing-ling Range, and on into eastern Honan. Southward we find it in north central Szechuan. Future thorough exploration will reveal much more of the range of this partridge, but at present we may roughly indicate its distribution by a triangle, with the points respectively at 102° E. 38° N. in the north; 111° E. 34° N. in the east, and 103° E. 31° N. in the south.

GENERAL ACCOUNT

Judging from the accounts of the collectors and explorers who have seen this bird, it is nowhere common, and its habits in general differ in no respects from those of the Himalayan species.

In the spring of the year the Northern Blood Partridges keep to the edges of the subalpine forests and shrubs. The centre of the range of this species is at least five hundred miles north of the Himalayas, and consequently the alpine zone is at a lower altitude. The average height at which these birds live is therefore less than in the more southern species. The character of the vegetation is also changed, and in Kansu, while they are found among firs, they also haunt low, stunted growths of sarbus, willows, mountain ash and cornus. In Shensi we read of their being found in bamboo.

In winter they form into coveys and descend lower on the mountains, where they find food throughout the cold months, and roost at night close together in the trees.

Przewalski describes the note of this bird as a long whistle—clear, but not very loud.

Eggs of the Northern Blood Partridge from Szechuan (*berezowskii*) are creamy-white, the surface covered with blackish spots and blotches.

DETAILED DESCRIPTION

ADULT MALE.—Forehead, lores and entire facial area shining black. Posterior edge of forehead, chin and lower malar area, back as far as or beyond line of the eye tinged with bright crimson. This occasionally extends as a rosy wash over the entire throat. Crown feathers elongated into a crest, ashy grey with white shaft-stripes. The elongated ear-coverts and lateral feathers of the crown also enter into the formation of the crest, the latter being brownish black, while the former have a conspicuous white shaft-stripe, which often terminates in an isolated, expanded streak.

Passing backward from the head, the ashy grey changes gradually into the greyish blue so characteristic of all the species of *Ithagenes.* From the scapulars to the tail-coverts the chief changes are a widening and slight greening of the shaft-stripe and an increase in the lateral black stripes.

The lesser and many of the median wing-coverts are identical with the dorsal plumage, then very abruptly, the individual feathers become particoloured in various patterns, the black and white stripes narrow and vanish, the latter greening before they disappear, while the blue area and almost immediately the entire feather changes to a golden buff, identical with the colour of the throat of the female *cruentus.* The rhachis remains ivory white and expands into a small but conspicuous terminal spot of greenish white. In a few feathers the golden buff is absolutely pure, but usually it shows strong crimson stains along the shaft or on the lateral margins. The inner secondaries are predominantly of the golden colour, which becomes fainter and narrower, limited to the outer margin on the outer secondaries.

The flight feathers are plain dull brown, with shining white shafts.

The longer tail-coverts, while retaining the two dark bands of the dorsal plumage, have a well-developed lateral crimson fringe. The rectrices, varying in colour from dark brown, through various mottlings to almost immaculate white, show the crimson fringe in a highly developed state.

The rose-tinged ash of the chin gives place to a warmer but paler buff which extends uniformly over the throat and breast. There is considerable variation in the latter area, some birds having it almost clear white. On the lower breast the feathers change abruptly to a clear apple green bordered with black, this colouring giving way in turn to mouse grey, down-like in texture, which covers much of the lower sides, flanks and belly. In very fully developed specimens one finds the green extending back to the flanks, giving the impression that the entire under surface from the lower breast is of this colour. In by far the greater number, however, the green occupies a more or less sharply defined mid-ventral zone, widest along the sides below the wings and barely reaching the mid line of the belly. Frequently the posterior part of the ventral green area is stained with buff or even crimson. The under tail-coverts are brilliant crimson tipped with white.

I have never seen this species in life, and so have to trust to published articles and labels for data as to the colour of flesh and eyes. The need for more accurate observation is well instanced by the labels on the skins of *sinensis*, on which we read that the eyes are "yellow," "red brown," "white yellow," and "gelbgrün"! As to length we may take our choice, in birds of equal age, of 16·2 inches, 17, 18 and 20 inches! Of the other measurements of adult males I can furnish more reliable data, taken at first hand, as follows: bill from nostril, 11; wing, 206; tail, 178; tarsus, 65; middle toe and claw, 61 mm. Almost fifty per cent. of the males have two spurs on each leg; the remainder having a less number in various combinations.

Adult Female.—The female Northern Blood Partridge possesses a number of characters intermediate between *cruentus* and *geoffroyi*, with a strong tendency toward the former. The head all around is decidedly ashy grey, becoming bluish on the crest, and with the elongated feathers of the rear crown dull black. These become more and more mottled with ashy as we pass downward on the side of the head, until the side, neck and throat show only a cold monochrome hue.

The upper parts are greyish buff, quite intermediate between the cold tint of *geoffroyi* and the warm buff of *cruentus*. The scapulars are very finely vermiculated with dark brown, this pattern changing into a coarser mottling as we pass backward. The tail-coverts merge insensibly into the pattern of the rectrices, gradually losing all trace of buff, the latter feathers being coarsely mottled with brown and whitish. Some of the rectrices have, as a constant character, a decided rose or even crimson tinge along the margins. The wing-coverts are like the back, with the mottling becoming more and more coarse on the secondaries and all but disappearing on the primaries. All these feathers, however, retain the buff hue. The under parts are pale sandy, and, like *cruentus*, lack vermiculation on the breast.

A certain proportion of females possess the interesting character of faint but distinct crimson markings on the breast feathers. These, in situation and pattern, correspond perfectly with the pectoral spots of male *cruentus cruentus*, consisting of two roundish spots, one on each side of the shaft about midway on the visible portion of the feather.

While such characters as these are not found in every specimen and are not necessary in a general summing up of the species, they are well worthy of record as showing how impossible it is to define exactly a species. They show how a character, dominant in the male birds of a Nepalese species, is to be found in the females of a supposedly entirely distinct species inhabiting central China. The females average: bill from nostril, 10; wing, 189; tail, 155; tarsus, 61; middle toe and claw, 58 mm.

Natal Down.—The chick in down is very distinct from *cruentus*. The head and neck, with the cold grey, almost whitish and black markings, are similar, but the down of the entire body, above and below, is very much colder and greyer. Instead of warm rufous-buff above there is only a trace of this on the mantle down. The central black stripe is grizzled greyish-brown and the lateral stripes are pale creamy-buff. The breast has a tinge of buff, but this hue is very faint on the rest of the ventral surface, the chin, throat and belly being white. The pattern of the sprouting wings is similar to *cruentus*, but the rufous-buff markings and tips are here replaced by pale buffy-white. Measurements: bill from nostril, 3; wing, 41; tarsus, 24; middle toe and claw, 22; length, 89 mm.

JUVENILE PLUMAGE.—This, too, is quite unlike the corresponding plumage of *cruentus*. The forehead and crown are not buff, but greyish brown, banded with black and buff on the occiput and nape. The colour of the upper surface is distinctly greyer, the terminal pale buff spots thus standing out much more clearly. The black bars on the wing-coverts are also very distinct. The chin and throat is still in the white down. The ventral surface differs much from *cruentus*. There is little hint of the pale buff shaft-stripe, the loose-webbed feathers being of a rather uniform brownish buff, indistinctly marked with darker and terminated, as on the upper surface, with a pale buff shaft-spot. This is especially marked on the breast and upper belly, the posterior plumage becoming even more loosely webbed and losing all distinguishing characters in a clouded brownish buff. The eight primaries are well grown. No. 9 is yet a mere unbroken sheath of 12 mm., and No. 10 is barely discernible above the skin. The measurements at this age are: bill from nostril, 5; wing, 102; tail, 48; tarsus, 36; middle toe and claw, 30 mm.

THREE-QUARTERS GROWN MALE.—A bird of about ten weeks is in active first autumn moult, nearly completed on the dorsal surface. The rosy feathers are detectable on the forehead, and the crown feathers are of good length, the black facial feathers are appearing and the black side, crown and ear-coverts show beyond the juvenile plumage. The featherlets of the bare facial area are all juvenile and are white with black tips, except in the subocular area where they are pure white.

On the dorsal body plumage the blue teleoptile feathers are in the ascendant, there being only a scattering of mesoptile plumage. These latter are dull and mottled, but in the distinct white shaft-stripe and lateral black bands they show a closer approach to the adult pattern than do the mesoptile feathers of *cruentus*.

The primaries show an unusual condition in that the inner eight are all actively growing, the bases showing a solid row of blood sheaths in each wing. All have white shafts. The wing-coverts are in full growth and the golden buff bids fair to be equal to that of any fully adult bird.

The rectrices are all new except the outer pair, which is juvenile. The next two inner pairs still show growth. The juvenile rectrices differ from the corresponding feathers of *cruentus* in being mottled with a cold grey rather than with buff, and having a white shaft. They measure 73 mm.

The new rectrices are clouded grey with *very* broad crimson fringes, well developed even on the 2nd from the outer pair.

The under surface, as in *cruentus*, is lagging behind in the progress of the moult, showing much of the mesoptile plumage. In the region near the bend of the wing, a small patch of green feathers is appearing, but all down the mid breast and posteriorly, the buffy-grey feathers are sprouting, vividly presaging the sharp delimitation of the green in the adult of this species. The few under tail-coverts are bright crimson. The measurements of this bird are: bill from nostril, 7; wing, 158; tail, 126; tarsus, 46; middle toe and claw, 44; length, 311 mm.

DAVID'S NORTHERN BLOOD PARTRIDGE

Ithagenes sinensis sinensis David

Type.—"Chensi," Père David, Ann. Sc. Nat., (5), XVIII. 1873, p. 1.

Geographical Distribution.—Highlands of the Yellow River region. Southerly slopes of the eastern Nanshan Mountains in Kansu (near the temple of Tschortentan on the Tetung-gol River). Northerly slopes of the Tsuiling Mountains in Shensi; the Laoling Mountains and from here eastward along the same slopes as far as Honan (David, Styan).

Subspecific Characters.—Male: Wing-coverts golden-yellow (not cinnamon or chestnut) tinged more or less with greenish. The shaft-stripes of the mantle and back clear white; traces of green appear on those of the posterior rump, this colour becoming still more distinct on the upper tail-coverts. General size medium, the wing measuring 205–213 mm.

Female: Sides of the neck grey (not cinnamon). The hind neck and feathers of the occipital crest uniform grey; ventral surface chocolate (not chestnut or cinnamon) brown. All the colours of the plumage are darker and more intense. Slight traces of crimson on the margins of the tail feathers. Size medium, wing measurement 190–199 mm.

Ithagenes sinensis sinensis David

"*Un Ithaginis*" David, Proc. Zool. Soc., 1873, p. 555.

Ithaginis sinensis David, Ann. Sc. Nat., (5), XVIII. 1873, art. 5, p. 1; David, Ann. Sc. Nat., (5), XIX. 1874, art. 9, p. 1; David, Jour., III. Roy. Explor. Emp. Chinois, I. 1875, p. 174; David & Oustalet, Ois. Chine, 1877, p. 402, pl. 114; Styan, Ibis, (7), V. 1899, pp. 292, 298.

Ithaginis geoffroyi (nec Verr.) Przewalski, Mongolia i Strana Tangut, II. 1876, Aves., p. 122; Przewalski, in Rowley's Orn. Miscell., II. 1877, p. 471; Przewalski, Trrtje puteschestv., V. 1883, Central Asia, p. 114; Deditius, Jour. für Orn., 1886, pp. 538, 540.

Ithagenes sinensis Ogilvie-Grant, Cat. Birds Brit. Mus., XXII. 1893, p. 270 (*partim*); Ogilvie-Grant, Handbook of Game Birds, I. 1895, p. 219 (*partim*); Dresser, Man. Palae. Birds, II. 1903, p. 675 (*partim*); Baker, Ibis, 1915, p. 126 (*partim*); Baker, Jour. Bomb. Nat. His. Soc., XXIV. 1916, p. 401 (*partim*)

Ithaginis sinensis sinensis Bianchi, Annuaire du Mus. Zoo. l'Acad. Imp. Sc. St. Petersb., t. VIII. 1903, pp. 1–10; Bianchi, trans. of above, Jour. für Orn., LII. 1904, p. 73.

MICHAEL'S NORTHERN BLOOD PARTRIDGE

Ithagenes sinensis michaëlis Bianchi

Type.—"River Chycho, Northern Nanshan Mountains," Bianchi, Ann. Mus. Zool. l'Acad. St. Petersb., VIII. 1903, p. 1. Type is in the Petrograd Museum.

Geographical Distribution.—Northern slope of the Nanshan Mountains. (It has been found on the Baboche River, a branch of the Edzingol, and by Grum-Grzimailo on the Chycho.)

Subspecific Characters.—Male: Wing-coverts pale golden-yellow (not cinnamon or chestnut) with decided mingling of green. The same hue appears well developed on the light shaft-stripes of the lower interscapular region, while it is the dominant colour of the entire stripe on the shoulders, back, rump and upper tail-coverts. General tone of coloration very plain. Size large, the wing measuring 226 mm.

Female: Sides of the neck grey (not cinnamon); hind neck and occipital crest uniform grey; plumage of under parts pale chocolate (not chestnut or cinnamon) brown. Coloration in general paler. No traces of crimson on tail feathers. Largest of the three forms, the wing measuring 203–210 mm.

A single male bird was collected by the Grum-Grzimailo brothers north of the principal Nanshan mountain range. This individual is larger and paler than the Blood Partridge from the southern slopes and shows so much greenish on the plumage of the mantle and lower back that this hue is quite distinguishable in the living birds when seen from above. This bird was named by Dr. V. Bianchi after one of the collectors.

Ithaginis sinensis michaëlis Bianchi

Ithaginis sinensis Pleske, Bull. Acad. St. Petersb., XIII. 1892, p. 297.

Ithagenes sinensis Ogilvie-Grant, Cat. Birds, Brit. Mus., XXII. 1893, p. 270 (*partim*); Ogilvie-Grant, Handbook of Game Birds, I. 1895, p. 219 (*partim*); Dresser, Man. Palae. Birds, II. 1903, p. 675 (*partim*); Baker, Ibis, 1915, p. 126 (*partim*); Baker, Jour. Bomb. Nat. His. Soc., XXIV. 1916, p. 401 (*partim*).

Ithaginis sinensis michaëlis Bianchi, Annuaire du Mus. Zool. l'Acad. Imp. Sci. St. Petersb., t. VIII. 1903, p. 1–10; Bianchi, trans. of above, Jour. für Orn., LII. 1904, p. 73.

BEREZOWSKY'S NORTHERN BLOOD PARTRIDGE

Ithagenes sinensis berezowskii Bianchi

TYPE.—" Sátani on the Sigu River," Bianchi, Ann. Mus. Zool. l'Acad. St. Petersb., VIII. 1903, p. 1. The types are in the Petrograd Museum.

GEOGRAPHICAL DISTRIBUTION.—Highlands of the Blue River region. Southerly part of Kansu Province (in the vicinity of the villages Dzjujuan and Sátani on the Sigu River in the district of the same name). North-western part of Szechuan (Choazigon Valley in the vicinity of Lungganfu, Sungpan, Tungpei and Yanglinpan). Southern slopes of the Tsinling in the southern part of Shensi (Hing kogu near Han tschungfu).

SUBSPECIFIC CHARACTERS.—Male: The wing-coverts are cinnamon or chestnut (not golden yellow), entirely free from green pigment, but with abundant carmine red. On the dorsal shaft-stripes the green appears only on the posterior rump and upper tail-coverts. The crimson colour on the margins of the rectrices is very strongly developed. The general tone of the plumage is dark. This is the smallest form, the wing measuring 187–209 mm.

Female: Sides of the neck brownish (not cinnamon or clear grey); hind neck brown, concolorous with the interscapular region; feathers of the occipital crest quite a distinct grey; prevailing colour of the lower surface obscure cinnamon. No crimson on tail-feathers. Smallest form, wing measuring 178–195 mm.

THE first specimens of this form were obtained by G. N. Potanius on an expedition to Kansu. Later, when others were obtained from northern Szechuan, and it was found that there was a decided difference between these individuals and those from adjoining regions, Dr. Bianchi separated them. The most important character is the cinnamon or chestnut wing patch, instead of the golden-yellow of the other *sinensis* forms.

Ithagenes sinensis berezowskii Bianchi

Ithaginis sinensis Berezowski et Bianchi, Aves. expedit. Potanini, 1891, p. 15 (*partim*); Styan, Ibis, (7), V. 1899, p. 298; Dresser, Ibis, 1905, p. 152.

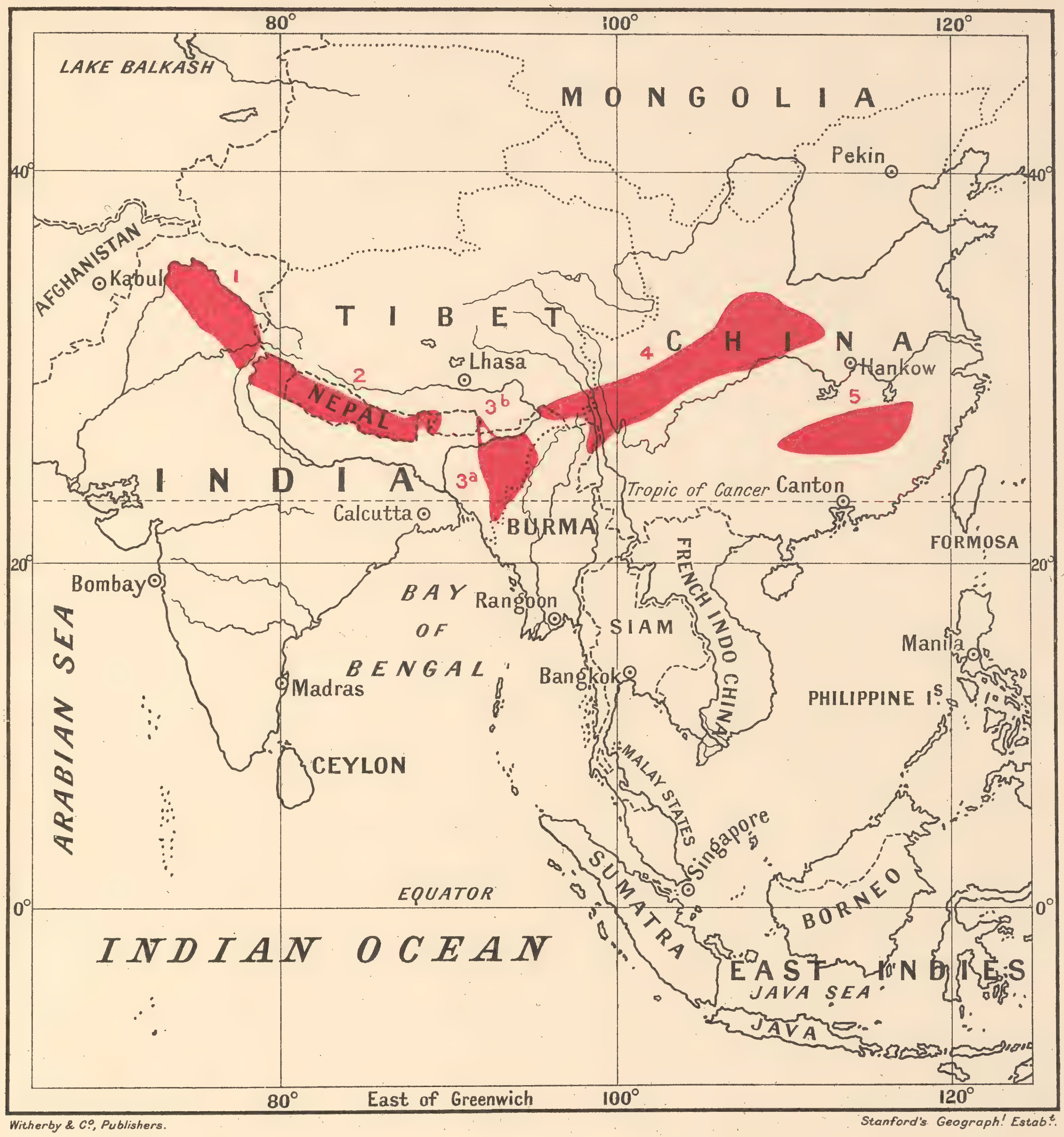
Ithagenes sinensis Ogilvie-Grant, Cat. Birds, Brit. Mus., XXII. 1893, p. 270 (*partim*); Ogilvie-Grant, Handbook Game Birds, I. 1895, p. 219 (*partim*); Deditius, Jour. für Orn., 1897, p. 62 (*partim*); Ogilvie-Grant, Ibis, (7), VI. 1900, p. 606; Dresser, Man. Palae. Birds, II. 1903, p. 675 (*partim*); Baker, Ibis, 1915, p. 126 (*partim*); Baker, Jour. Bomb. Nat. His. Soc., XXIV. 1916, p. 401 (*partim*).

Ithaginis sinensis berezowskii Bianchi, Annuaire du Mus. Zoo. l'Acad. Imp. Sc. St. Petersb., t. VIII. 1903 pp. 1–10; Bianchi, trans. of above, Jour. für Orn., LII. 1904, p. 74.

TRAGOPAN

HORNED TRAGOPANS

MAP III.


80°
100°
120°
LAKE BALKASH
MONGOLIA
Pekin
40°
AFGHANISTAN
Kabul
1
TIBET
CHINA
2
NEPAL
Lhasa
3b
4
Hankow
5
INDIA
3a
Tropic of Cancer
Canton
Calcutta
BURMA
FORMOSA
20°
Bombay
BAY OF BENGAL
Rangoon
SIAM
FRENCH INDO CHINA
Manila
Madras
Bangkok
PHILIPPINE Is.
ARABIAN SEA
CEYLON
MALAY STATES
Singapore
SUMATRA
BORNEO
EQUATOR
0°
INDIAN OCEAN
EAST INDIES
JAVA SEA
JAVA
East of Greenwich

Witherby & Co., Publishers.

Stanford's Geograph! Estab!.

MAP SHOWING THE DISTRIBUTION OF THE TRAGOPANS.

Region	1.	Tragopan	melanocephalus.	Region	3b.	Tragopan	blythi molesworthi.
„	2.	„	satyra.	„	4.	„	temmincki.
„	3a.	„	blythi blythi.	„	5.	„	caboti.

TRAGOPAN

HORNED TRAGOPANS

FAMILY PHASIANIDAE

Subfamily PERDICINAE

Genus TRAGOPAN

The Horned Tragopans or Satyr Pheasants form a compact genus of five distinct species. They are large, heavily built birds, and the sexes are very unlike in colour. Both are extremely beautiful, the females of various shades of brown with harmonious mottlings of black and buff, while in the males the predominating hues are red, brown, and black, extensively spotted with white or grey. The cocks have short crests, two fleshy horns, and a large, brilliantly coloured, bib-like throat wattle or lappet. These dermal ornaments reach their greatest development at the breeding season. The cheeks and throat of the males are bare or covered only thinly with feathers.

The bill is short and stout. In the rounded wing, the 1st primary is shorter than the 10th, and much shorter than the 2nd; the 4th or 5th is slightly the longest. The tail of eighteen feathers is quite long and wedge-shaped, the outer pair of rectrices being about two-thirds the length of the central ones. The tail is a trifle over six-sevenths the length of the wing. Its moult takes place from the centre outward. The tarsus is about equal to the middle toe and claw, and in the male is armed with a short, stout spur.

This genus extends from Kashmir on the west, along the Himalayan Range into central China, where we find it on the higher mountains within the area bounded by Shensi on the north, Fokien on the east, and Kwangsi and Yunnan to the south.

To the single species of Tragopan which was known to Linnaeus in 1766, he applied the generic term of *Meleagris*, and M. Lesson, over sixty years later, was scarcely less happy in the choice of *Satyra*. For, while eminently appropriate etymologically, the term had long been used by entomologists, thus rendering it unavailable as a generic name. Cuvier, one year later, in 1829, in the first volume of his classic Règne Animale, made use of the word *Tragopan*, and any one who has seen these birds in the act of courtship, or listened to their weird cries among their mountain haunts, will appreciate its unusual aptness; they are indeed veritable "goats of the good god Pan," horns, pipe and all! The Greeks and Romans gave this name to a fabulous bird, of which Pliny writes (10. 136): "Equidem et tragopana fabulosum reor, de qua plures adfirmant, maiorem aquila, cornua in temporibus curvata habentem, ferruginei coloris, tantum capite phoeniceo."

Swainson in 1837 substituted *Ceriornis*, which has since been used by many writers. But, although Swainson considers that the term Tragopan "is in every way objectionable," it has the profound merit of priority, and, hoping it may make toward the long-desired goal of stability in nomenclature, I have chosen to adopt it. "What's in a name?" Let us pass from discussion of the artificial handle applied by man during the last few years of the Tragopans' existence, to the really vital study of the birds themselves.

TRAGOPAN

	Type.
Satyra Less (nec Meig. Dipt., 1803), Dict. Sci. Nat., LIX. 1828, p. 196	*T. satyra.*
Tragopan Cuv. (nec Möhr. Av., 1752), Règ. Anim., éd. 2, I. 1829, p. 479	"
Ceriornis Swains., Class. Birds, II. 1837, p. 341	"
Ceratornis Cab., in Ersch. u. Grub. Encycl., sec. 3, XXII. 1846, p. 150	"

Five full species and one subspecies of Tragopans are recognized—

Satyr Tragopan	*Tragopan satyra* (Linnaeus).
Western Tragopan	" *melanocephalus* (J. E. Gray).
Blyth's Tragopan	" *blythi blythi* (Jerdon).
Tibetan Tragopan	" *blythi molesworthi* Baker.
Temminck's Tragopan	" *temmincki* (J. E. Gray).
Cabot's Tragopan	" *caboti* (Gould).

KEY TO *TRAGOPAN*

I. Head carmine and black (males).
a Under surface spotted.
a′ White spots on carmine . . . . *satyra.*
b′ White spots on black . . . . *melanocephalus.*
c′ Large pearl-grey spots . . . . *temmincki.*
b Under surface not spotted.
d′ Breast crimson.
a″ Crimson extending well over breast . . . . *blythi blythi.*
b″ Crimson confined to a narrow gorget on neck and upper breast . . *blythi molesworthi.*
e′ Breast buff . . . . *caboti.*
II. Head not carmine and black (females).
a Upper plumage streaked with white.
a′ Dominant ventral colour grey . . . . *melanocephalus.*
b′ Dominant ventral colour white or buff . . . . *caboti.*
b Upper plumage not streaked with white.
c′ Bend of wing rich orange-carmine.
a″ General tone olive; black ocelli dominant on upper plumage . . *blythi blythi.*
b″ General tone buff; black ocelli not dominant on upper plumage . . *satyra.*
d′ Bend of wing not orange-carmine . . . . *temmincki.*

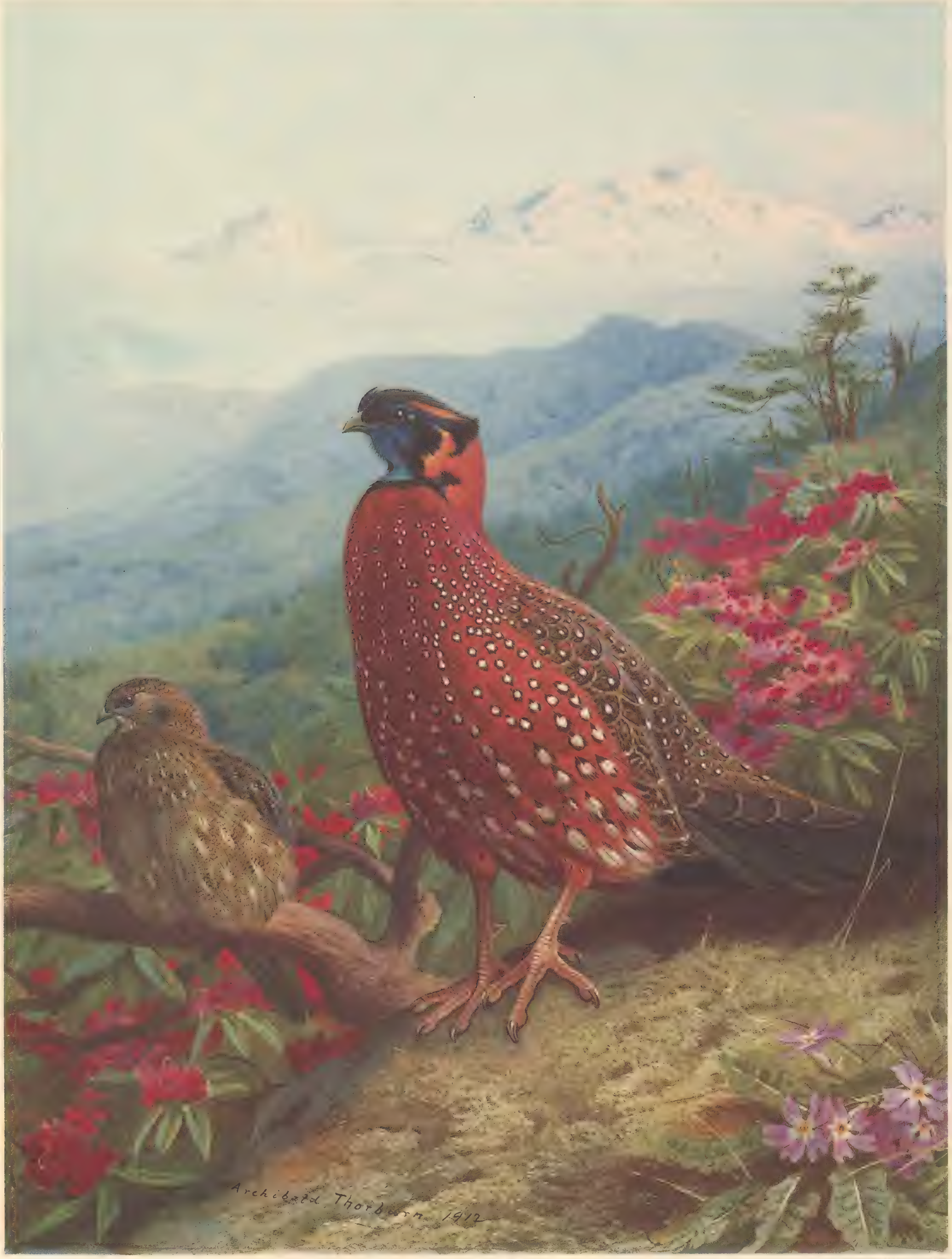
PLATE VII

THE SATYR TRAGOPAN

Tragopan satyra (Linnaeus)

THE place is Sikhim in the Eastern Himalayas, looking toward Kabru and Kinchinjunga; the time is early May at ten thousand feet, when spring is at its height. The Satyr Tragopans have finished their courtship and paired, and in a few days will begin to nest. From some mossy perch the booming crescendo challenge of the cock rings out every morning. Around him the rhododendron trees are masses of colour; scarlet, salmon, cerise, pink and rose, and beneath, the ground is lavendered with alpine primroses. Words can never describe the beauty of this magnificent bird in its Himalayan home.

PLATE VII


Archibald Thorburn 1912

THE SATYR TRAGOPAN.

SATYR TRAGOPAN

Tragopan satyra (Linnaeus)

Names.—Generic: *Tragopan*, from the Greek *τϱάγος* goat, and *Πάν* the name of the god; literally goat-Pan. Specific: *satyra*, Greek *σάτυρος*; a satyr was a semi-deity, inhabiting forests, with the horns and hind limbs of a goat. Both names from the fleshy, erectile horns on the heads of these birds, suggestive of a satyr or goat-like creature, suggestive of the old Greek god, Pan. English: Satyr or Crimson Tragopan; Sikhim Horned Pheasant; Indian Tragopan. French: Tragopan de Nepaul. German: Satyrhuhn. Vernacular: Lungi (Garhwalese); Monâl (Nepal); Omo, Boop (Bhutian); Tar-rhyak (Lepcha); See-a-géa (Chinese Tibetan).

Brief Description.—Male: Most of the head and terminal half of tail black; mantle and under parts orange-carmine; rest of upper plumage olive-brown; above and below (except on upper mantle) thickly spotted with white. Female: Above blackish mottled with buff, pale rufous and sandy; below lighter, a central whitish area on the feathers predominating over the buff and blackish mottling; tail irregularly barred with rufous and black.

Type.—*Meleagris satyra* Linnaeus, "Habitat in Benghala," Sys. Nat., I. 1766, p. 269.

Range.—The higher, wooded slopes of the central and eastern Himalayas.

THE SATYR TRAGOPAN IN ITS HAUNTS

The dawn of a new day had broken in the eastern Himalayas, gilding first the pinnacle of Everest, for so through all the long centuries had the greatest source of light paid homage to the highest point of earth. Instantly all the lesser snow-peaks were aflame, reflecting the glow downward to where I was still deep in shadow. The trail at this hour was saturated with the dews of night; below me, like a sea of tumbled snow and ice, lay the clouds—solid, compact, opaque—filling every valley and gorge. So quietly floated this vapour, that one's knees were dimmed by its chill blueness, while the face was still in the clear transparent air above.

I tramped softly over the mossy trail, the distant sleepy croak of a raven coming to my ears, or the chirp of some just-awakened titmouse from the bushes at the trail side. A rhododendron branch, heavy with its gummy, unopened buds, swept across my clothing, drenching me with a myriad dewdrops. I was on a high ridge, and the slope on each side dropped almost sheer into the blue-grey mystery of the cloud. The scores of square miles which I overlooked consisted of an archipelago of mountain tops, clad in dark green, rising from the sea of cloud and crowned with the gleaming snows. In all this land the only visible life was the slowly soaring form of a griffon vulture, showing dark against the fog, pale against the forest. With outstretched head, the bird rose higher and higher, at last catching the direct gleam of the sun and changing to molten bronze, a glorious majestic form, the first life of day to greet the sun—"thus may splendour come to the low caste."

That subtle hesitancy which is a characteristic of early dawn was now about to cease. A rustle of bamboo leaves and a downpour of drops presaged the morning breeze, and the surface of the cloud slowly heaved and billowed. A sudden turn in the trail brought me downward toward a dense growth of ringal bamboo, whence the way led over a narrow saddle, the sides dropping steeply on either hand. Hardly had I stepped into the cloud level when I was startled by a sudden, deep whirr of wings at my very feet—the loud, reverberating roll of strongly beating pinions. A second of silence and there burst from out of the fog, fifty feet away, a splendid bird, glowing, as it veered sideways, with richest carmine and besprinkled with a myriad white stars as of shining dewdrops. I gazed in rapt admiration at the great cock Tragopan, as on set wings it scaled swiftly away in a long, graceful curve, which at last immersed it again in the billowy waves of blue-grey vapour.

For days I had been studying this wary bird, but never had I been so struck with its glorious beauty as when, like the flying fishes in the far distant ocean, it had so unexpectedly burst for a moment through the surface of cloud into the clear upper air.

A few minutes after the Tragopan had vanished, the forces of the mountains began to make themselves felt. A rushing wind came down from the face of the snows, and by some physical alchemy the cloud siphoned across the low saddle of the ridge. In seething cascades of vapour it poured from one valley into the other—cold, steamy, drenching, like the exhaust from some hidden titanic engine. I could hardly breathe, and was relieved to climb out of the river of steam again into the sunshine of the heights.

A white-browed bush-robin began its simple, sweet phrases, and the buzz of a wild bee announced the beginning of a new day's toil for the lesser mountain-folk. Then a long-drawn-out wail, a voice apparently of lost hope, came from far down in the cloud-ridden valley. It was the mating call of some wandering, furry cat-bear—or else the challenge of a Satyr Tragopan—indistinguishable at this distance to our coarse hearing.

GENERAL DISTRIBUTION

The Satyr Tragopan is confined to the higher wooded mountains of the central and eastern Himalayas. Its life-zone extends from a height of twelve thousand feet down to seven and six thousand, but either extreme is reached but seldom.

The Satyr Tragopan may be given third place in an altitudinal classification of Himalayan pheasants. It does not, as a rule, ascend as high as the monâl, and only occasionally enters the zone of the blood partridge.

In dense forests of eight to ten thousand feet elevation this splendid bird may be found from Kumaon eastward through Nepal and Sikhim, and in Bhutan at least as far as the Tongsa Chu. Its range in the west seems to end rather abruptly. Hume, writing in 1872, gives the Alaknanda Valley as the last area inhabited by the Satyr Tragopan, with a single male shot three valleys west, in the Kattar. I heard of two more shot in the latter valley. Its north and south distribution is controlled by the limits of suitable forests. It never descends to the hot plains, nor does it reach the Tibetan tableland north of the hill forests.

GENERAL ACCOUNT

Compared with blood partridges, Tragopans are most solitary birds, and although they wander about considerably, yet it is unlikely that they have any wide individual range. In the spring one may flush a Tragopan cock and see it scale across a deep, wide valley to the opposite forest slope, but if undisturbed for a few days, a bird—and very probably the same one—may be found in the same patch of forest. Once only was I able to verify this, when on two occasions, some three days apart, a bird, marked by a gap in the tail feathers where one or two had been lost, was flushed by a native's dog and flew a long way, from one ridge to the next. The birds found on any one range undoubtedly spend their life there, unless driven away by persecution.

I have never observed the Tragopans on any ridge or slope where the adjacent valleys were dry, and when one hears or sees them far up the mountain side, a tumbling little rivulet is almost certain to be found in the nearest gully.

The only way to study these birds, or to catch more than a glimpse of them, is by hours of patient watching in their haunts. One may stalk blood partridges or kaleege pheasants with some hope of success, but Tragopans, owing to their wariness and the nature of their favourite slopes, can only be waylaid in ambush: unless, of course, one is shooting, when with dogs one can beat them out of the thick cover. But a Tragopan fluttering upward through columns of bamboos, or fleeing for safety to a branch ahead of a hunting dog, presents little of interest except to the eye along the gun barrel.

In Sikhim and eastern Nepal, where in spring I have studied Satyr Tragopans, I found that narrow side gorges, etched out of the slopes by tiny uncharted streamlets, were the best places for finding the birds. Here, in the early spring, when the melted snows swelled the rivulet to a rushing torrent, the carpet of crackling bamboo and rhododendron leaves was swept away, leaving the clean, outjutting rocks and an overarched tangle of broken bamboo stems. In early May, when the torrent again subsided, one could make one's way silently down the dripping mossy boulders, from far up the mountain slope to the very bottom of the valley. A single step into the jungle on either hand would have sent forth a crackle of leaves, arousing and alarming every living creature in the gorge.

The Tragopans of this region—of at least six widely separated ravines south of the Kong La Pass—roosted low down in the valleys. I could never discover the birds when they went to roost or left their perches. Once, however, in early morning, I heard a cock utter his mating call from his roost. I flushed him at once after he called, and from sign knew he had spent the night there. The tree was a magnolia of moderate size, and, climbing to a branch directly overhead, I found the moss pressed tight where his toes and breast had been. This was twelve feet from the ground and only a few yards from a spring which gushed up from the heart of a ledge of mossy rocks.

Although the birds invariably roosted far down the valley, they fed both morning and evening well up the slopes. These slopes which the Tragopans love to frequent at this time of year are altogether delightful to the lover of the wild beauties of this Himalayan wilderness. All one's senses are charmed—sight, scent and hearing. We leave our camp under the lee of the mountain ridge and make our way to the nearest ravine. The sun gives a welcome warmth and the last of the night's cloud mantle drifts past in torn shreds and whiffs of vapour. Before we turn down into the ravine, a last look around shows range after range of splendid mountains, the nearest green and sombre, the others becoming more vague and purple as they pass into distance, until, like a lodestone, the eye is drawn up to the crown of mighty snow-peaks, glowing pink and white. Here and there on the slope before us gleam the white stars of magnolia blossoms, and to our left a slash of scarlet and another of pale salmon show where forests of rhododendrons are in full blossom. We step down and in rubber-shod footgear silently clamber from ledge to boulder, each moss-clad and lichen-painted. For a while we hear no sound save the tinkle of drops in the plash of some diminutive waterfall. Then comes a subdued murmur, chirps and twitters, and, peering over a great mass of rock, we see a rhododendron tree loaded with blossoms of an intense cerise, all a-quiver with the forms of a hundred little birds. There are scores of flower-peckers clad in delicate hues of grey, vinous and orange-buff, and still smaller flycatching-warblers in liveries of yellow and olive-green. A perfect medley of metallic notes arises, and far off to the left another tree in bloom is traceable by ear from a similar dainty tumult.

Every now and then the breeze coming down the ravine is heavy with the strong, sweet perfume of the daphne or paper lilac, and the pink flowerlets are floating on every quiet pool. Where an earthen bank shows clear of bamboo stems, it is starred with blossoms, primroses, violets, strawberries and forget-me-nots. Everywhere the ravine is sweet with perfume and glowing with colour.

Down and down we clamber, the bamboos in some places growing close to the narrow torrent bed in serried ranks of mottled green and brown. Under a projecting bank of earth a pair of orange-gorgeted flycatchers are working on their half-finished nest, and show no fear of us as we stand within arm's reach. Not a note of annoyance do they utter, but only watch us with dark, liquid, reproachful eyes until we disappear around the next turn. Here we find a deep, boulder-framed, half-cavern and crouch down within its cool shadow.

We hear some small creature making its way through the bamboo close at hand, and now and then a sudden crackle of leaves shows that it is a bird scratching among the litter. Several minutes after it passes we look out and see a Tragopan hen twenty feet above, drinking from a pool. A sudden *quak! quak!* from down the ravine draws our startled glance to a cock Tragopan just disappearing over the feathery bamboo tops, and when we again look upward the hen has vanished and our Tragopan study is over for that morning. Such is a glimpse of the haunts of these glorious birds.

As in the case of other birds inhabiting these lofty regions, Tragopans work gradually downward at the approach of the cold and snow of winter. Even at this season, however, there seems to be little or no gregariousness on the part of the birds, although, from the reports of English sportsmen and natives, one or two young birds and the mother keep together for the greater part of the winter. At this season of the year the birds are silent, unless the hen still communicates with her nearly grown young by means of the same low, clucking call which is used when they are chicks. Only when in dire fright or distress, as when suddenly flushed by a dog, do the birds—both cocks and hens—give utterance to a series of loud, raucous notes: *quak! quak! quak! quak!* This is language whose meaning is clearly understood by all feathered creatures within hearing, and after the echoes of the alarm have died away, they will often be taken up by the croaks of a pair of inquisitive ravens, or

PHOTOGRAVURE 4

HIMALAYAN HOME OF THE SATYR TRAGOPAN

In early morning the swish of a lammergeier's wings is heard through the close-lying clouds, and the croak of a Himalayan raven comes faintly. Then a Satyr Tragopan calls and the mist sweeps from the valley. The snows are still hidden, but we see the slopes covered with a dense forest of rhododendrons and magnolias. Through the day these birds feed among the underbrush, and if they escape the eye of eagle and cat, and avoid the snares of the Nepalese shepherds, they will roost at night in some safe perch, high above the dangers of the earth.

HIMALAYAN HOME OF THE SATYR TRAGOPAN

the calls of nutcrackers. Every bird for many yards around knows that something is wrong, and will be uneasy and on its guard for a time.

When the birds perceive approaching danger some distance off, they utter no sound whatever, but silently slip away. Even when surprised, they sometimes fly off silently, with beak open in fear, but only the sound of their wings to mark their aerial path.

The call note of the Satyr Tragopan is very distinct from its cry of alarm. I have heard it a number of times given by wild birds, and in captivity it is a very characteristic utterance. It differs in the two sexes. The male utters it as a herald of his nuptial display—a high, rather quavering *báá! báá! báá! báá!* Where this is heard the hen is usually near by, and, unless something occurs to alarm the birds, a display is almost sure to follow. The hen utters a call comparable to this when separated from her nearly grown young, the call in this instance being given singly and in a slightly higher, shriller tone.

The challenge of the adult cock Satyr is a most remarkable sound, to which I have already alluded. It has a wonderful carrying power, and I have heard a bird call from the same point about every ten minutes for a full hour as I climbed away from it, coming fainter but as distinctly at a half mile distance and elevation as at first. When heard fifty yards away its deep, half-booming, half-bleating character is very evident, a weird, full-throated cry, which seems peculiarly fitted to the heart of this rugged wilderness. At this distance one can fit no written words to it, but further away, when more softened, it may be indicated *wah! waah! oo-ah! oo-aaaaah!* the last tone sometimes drawn out into a heartrending crescendo wail. These syllables usually run together so as to sound like a single utterance, and indeed they are the result of one exhalation. The panda, or cat-bear, another inhabitant of these Himalayas, utters, as I have said, a sound not unlike the Satyr Tragopan, but when heard close at hand the nasal, feline character of tone of this brightly coloured, raccoon-like animal is apparent. The Lepchas call it Wah from this cry.

As stated by C. P. Smith, Tragopan cocks in captivity utter this call during only a few days of the breeding season, but this is doubtless because the combative phase of courtship is soon at an end—anticipated, perhaps, by the absence of rivals and close association with the hen. In wild birds the challenging is kept up for at least two weeks and probably longer. At this time the cocks select some favourite perch or beat and call from it day after day, especially in early morning. In regions where the birds have been persecuted they may be made to boom by a sudden loud shout, the discharge of a gun, or by a rock rolled down some steep bit of jungle slope. I have heard these birds burst into cry after such a stimulus, late in the morning. However, they usually call but once under such conditions.

Native hunters are adepts at answering the birds and thus luring them within gunshot, and I have myself been able on several occasions to get the birds to answer five or six times. But as the Tragopan approaches it becomes more wary and always something seemed to give it warning of my perfidy. This answer and advance proves that the call is a challenge to rival cocks, and not a summons to the hen, as the latter never utters the booming note. Pheasants, when in the forest or jungle, seem seldom to look for danger from above, and one may watch them from a low branch for minutes at a time, when it would be impossible to remain concealed on the ground; their sharp eyes ferreting out the cleverest blind. So in the case of Tragopan calling as with the other pheasants, I have always had the best luck when concealed in a low tree. On one such occasion my Tibetan called a Tragopan until it appeared from the neighbouring rhododendron scrub, and walked swiftly out and around the very tree in which we were perched. Its feathers were pressed close to the body, its head held high, and all the usual heavy, rather hen-like appearance was gone. It was altogether a game-cock, imbued for the time with that strange, instinctive hatred for its fellows which has come down through all the ages and which annually brings about temporary civil warfare among so many creatures—doves as well as lions. Now and then it gave a quick impatient flirt to its wings, showing how keenly on edge was every nerve and muscle. Then it stopped and, inhaling deeply, partly raised its beak and with an effort sent its deep call booming out across the valley. My man dared not answer, and for a full minute the bird waited and listened, then passed quickly on into the forest. I was fortunate to have had such a glimpse of a calling pheasant and not to have alarmed it. Only one who has tried to watch a wild Tragopan will know how tense and breathless I sat while the bird remained in sight.

It seems as if the full booming call was developed only at the breeding season, as one never hears it except during April and May. I have twice known a young cock in captivity to essay the challenge, but to fail pitifully, a short wheezy *wap!* being the best it could do.

Tragopans are omnivorous feeders, but leaves and buds seem to form the principal articles of their diet. Hume states that they feed on insects, the young green shoots of bamboo and on onion-like bulbs; Hodgson adds wild fruits, the seeds of rhododendrons, and aromatic leaves such as daphne and bastard cinnamon. The crops of three birds which I examined were well filled; two held many torn leaves and flowers of the sweet-scented paper laurel, and one of these had also eaten a number of insects—several small earwigs, black ants and a good-sized cockchafer, as well as a few spiders and a small white centipede. The third bird, curiously enough, had packed its crop with the bruised scarlet petals of rhododendron blossoms, mixed with a few laurel leaves.

Satyr Tragopans, like the majority of forest and low-country pheasants, confine much of their activities to the early morning and late afternoons, but on dull, cloudy days the birds may be found feeding at more irregular intervals. They feed on the open edge of the forest, or scratch deep amid its undergrowth. And, too, they not uncommonly feed in low trees and bushes, where they obtain petals, buds and berries. With powerful glasses I have watched a cock Tragopan in full sunshine one hundred yards away, climbing about the bare branches of a magnolia, picking here and there at the long moss.

The Tragopans seemed to feed on the upper slopes for only about two hours in early morning, when they apparently descended again, as none could be found the rest of the morning except in the lower valley.

Occasionally a bird would make its way upward five hundred feet or more to the crest of the ridge, and here I found they were scratching and feeding along the old sheep trail. When I have examined the work of a bird scratching in the jungle, I have found single, fairly deep holes here and there, perhaps a yard or more apart, as if the Tragopan had concentrated its efforts in some likely spot instead of scratching vaguely and superficially over a wide area as the kaleege pheasants are wont to do.

The feral enemies of the Satyr Tragopan assuredly are of less account than its present danger from mankind, but from the natural wariness of the bird we must infer that they are bad enough. And here we must mention the remarkably arboreal character of this and other Tragopans, as probably indicating unusual dangers to be feared on the ground. Eagles, leopards, foxes, and especially the jungle cat and the larger species of civets are probably most to be dreaded. Mr. Ray Ellis, in Calcutta, told me that he once shot a leopard which had just dropped a still warm, dead Tragopan. The locality was fir forest with occasional clumps of thick rhododendron bushes.

When approached by a man, the bird will almost invariably run swiftly away, head low, threading rapidly the bamboo stems, but when suddenly surprised or when rushed by a dog, the bird flies at once, rising with a loud whirr. In the latter case, the birds, as Hume tells us, will often fly straight upward into a tree, where they will crane their necks down at the dog, uttering subdued alarm notes, and influenced apparently as much by curiosity as by fear. Even where they have been but little hunted, they leave their perch at once on the appearance of man—sahib or native. Without hesitation, a Tragopan will interpret and act on the notes of warning or alarm uttered by ravens or laughing thrushes, and although the pheasant may have had no direct hint of danger, it slips instantly away when it hears the angry croaks or the cachinnations of the other birds.

RELATION TO MAN

The Nepalese shepherds have learned that these birds ascend and descend the slopes of the valleys to feed, and they take advantage of this by erecting a low, wattled cross fence which extends across the usual route taken by the birds. In this are left several openings, and here nooses are strung or scattered about on the ground, and the poor bird has slight chance of evading this entanglement. Occasionally these natives will have a drive, when by forming a line and slowly advancing they can force several birds toward and through the openings, the birds, when not frightened, choosing to escape by running rather than by flight. I once purchased from a Nepalese a bundle of about two hundred yak-hair nooses. He told the interpreter that there were four "monâl" in his valley; two he had already caught and eaten, and the others he would soon have.

Captain Beavan, who has written of this method of snaring Tragopans, notes that four or five times as many cocks are caught as hens. I think this is due to the fact that the hens rely much more on their mottled colouring and will sometimes not move until almost stepped on, and thus many are liable to be passed by the line of beaters, while the more nervous, suspicious cocks flush more readily, and run on to avoid discovery.

In shooting this bird, sportsmen count on a sudden surprise in early morning when the Tragopans are out feeding, or else by a systematic beating with dogs, although if the bird once realizes the full danger and retreats into the depth of some dense bamboo jungle there is no hope of getting at it. I have seen such growths which no man or dog could penetrate, the stems sometimes almost touching each other at their base, so that one's shoe would slip down and become locked between them a foot or more from the ground, making progress impossible.

CAPTIVITY

Satyr Tragopans were bred in captivity as long ago as 1863, and in the London Zoo alone they have been reared at least a dozen times. To-day, however, over half a century later, we must admit that they have not become established anywhere, be it in zoological garden or private aviary. The birds pair readily, the hen lays and is a faithful sitter, and with moderate care the chicks grow to maturity and even breed in turn. But in the long run their viability in captivity is poor. Mitchell's figures show that, of twenty-one individuals of this species, the average length of life is only a year and seven months, while the maximum length of life recorded of a captive bird is four years and ten months. There seems to be no disease to which these birds are especially susceptible, but owing to the radical changes to which our low altitudes and wide range of summer and winter temperature subject them, their resisting power is lowered, and they succumb often to some secondary affliction.

Next to Temminck's tragopan the Satyr is most commonly seen in captivity, but many more birds find their way to England and Germany than to America. Dealers in New York charge from fifty to one hundred and twenty-five dollars a pair, according to the demand at the time.

As regards egg-laying, Satyr Tragopans in captivity vary from mid April to late in June, and I have known a single egg to be deposited in August. In this case it is of interest to note that there was considerable excess of pigmentation—the reddish spots being of such size that they were almost confluent.

The time of incubation has been reported at from twenty-four to twenty-eight days. My single personal record is of a chick which began to chip the shell on the twenty-sixth day, and had it not died would have emerged early on the twenty-seventh day. The majority of the dates of hatching in captivity extend from May 28th to July 24th, and in all probability represent the normal seasonal average of wild birds. The eggs are deposited two days apart.

As in all birds, individuality is strongly marked in the hens, and while one will sit faithfully, another bird will neglect either its eggs or young. There is no difficulty, however, about hatching the chicks under common hens. There appears to be no account of the nesting of this species. Eggs laid in captivity measure from 61 to 67 mm. in length and 40 to 42 in breadth; an average of 64 × 41 mm. The background is dull white or buffy, variously marked with pale lilac, reddish ochre or dark brown. They may be evenly speckled all over, or blotched irregularly around the centre or the larger end. I have seen one or two eggs in which the markings were almost confluent.

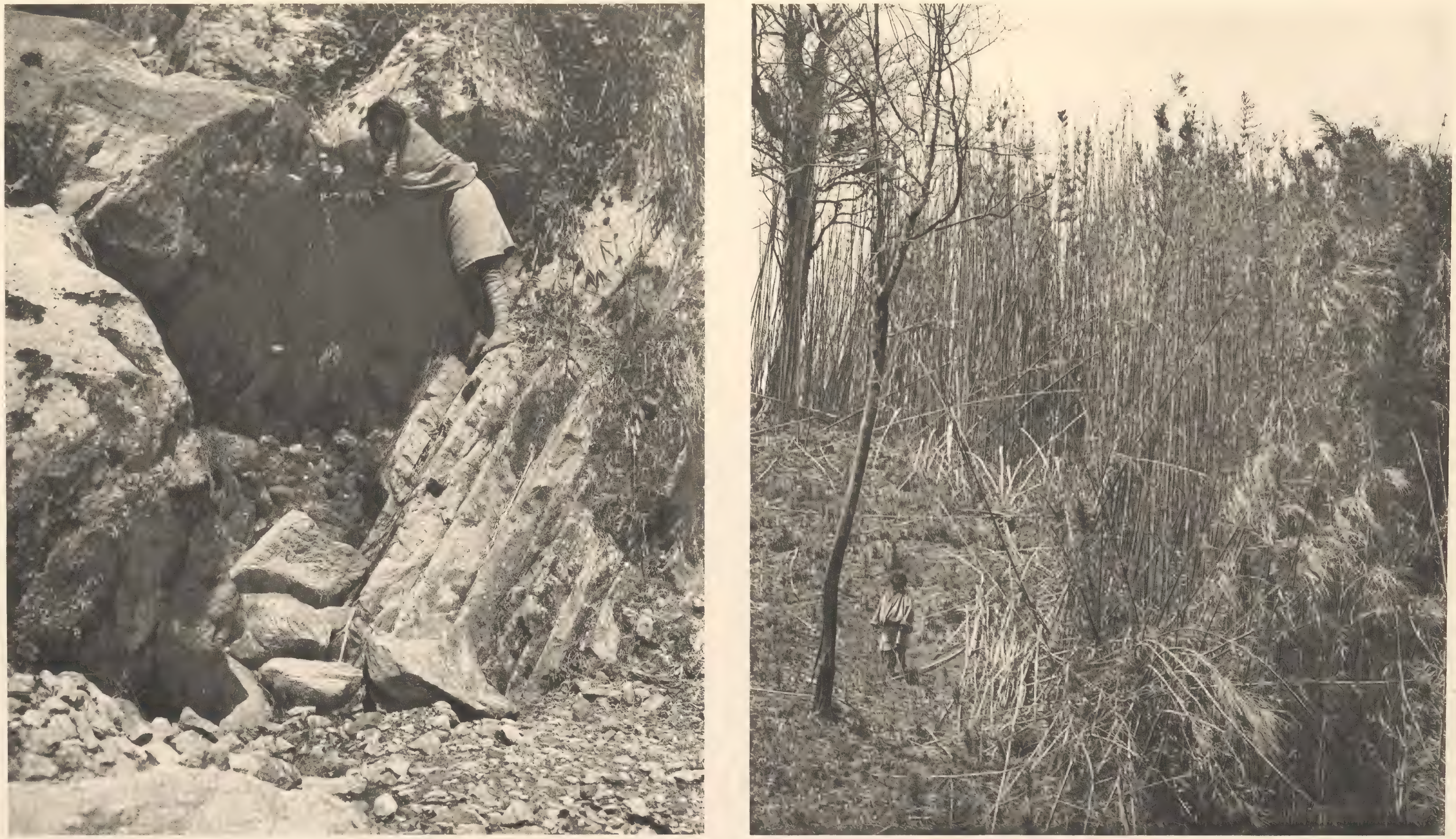
We have some interesting data in regard to the importation of living Satyr

PHOTOGRAVURE 5

BREEDING HAUNTS OF THE SATYR TRAGOPAN

When the Tragopan makes its nest it leaves the more open forested slopes and descends some steep, cool ravine. Here the bamboo grows on either hand in ranks so dense that a man cannot force his way through. The heart of the ravine is clear, the rushing torrents in early spring having swept every growth away save moss and rock-clinging patches of grass. Here a trickle of icy water tinkles its way downward to the river far below, and within sound of its drops the Satyr hen lays her eggs. They are well hidden, in the heart of the friendly bamboo and rhododendron scrub. The silicious stems rise in serried rows in all directions, presenting a sheaf of spear-tips to the soaring eagle, and the crackling of the dried fallen leaves reveals the approach of every marauder. Only occasional Tibetans straggle along the distant trails and the dull-hued hen sits safely and finally leads forth her brood for their first drink in the depths of the rocky ravine.

PHOTOGRAVURE PLATE 5



BREEDING HAUNTS OF THE SATYR TRAGOPAN

Tragopans from Asia to Europe. Between the years 1864 and 1882, Mr Jamrach imported two thousand three hundred and forty-three impeyans and Satyr Tragopans, about one-third being of the latter species. Of these, one thousand one hundred and eighty-five, or about fifty per cent., died en route. The most interesting thing, however, is the gradual change in mortality, decreasing from year to year as better methods of transportation and feeding were discovered. Beginning with 1865 and ending with 1879, we have the following percentages of birds living to reach their destination: 0 per cent.; 0, 3·7, 0, 40, 8·9, 13·3, 10, 15, 77·5, 87·5, 80, 100, 95 and 100 per cent.

As Temminck's is the tragopan with which I am most familiar, I shall give a more detailed account of the courtship and the captivity of that species.

I have seen the Satyr Tragopan in only partial display and gladly quote the following account given by Mr. Barnby Smith: "The lateral display of a cock Tragopan in good plumage is interesting; that is, he presents one side of the head, body, and tail to the hen, and lowers one wing and raises the other until he almost looks like the mere skin of a bird stretched flat on a wall. This pose is constantly assumed during the breeding season (from February onwards), the cock taking up a position about a yard distant from the hen and repeatedly assuming a new position if she moves off.

"This lateral display, however, is as nothing compared to the frontal display, which I usually notice some three or four times each season. In this case the cock faces the hen (about two or three yards distant) and commences by crouching down slightly, ruffling his feathers and spreading his wings, which are slowly flapped on the ground. The head is nodded repeatedly with increasing speed and the brilliant light blue horns gradually become inflated and extend forward from the black feathers of the head, whilst the bib (or gular wattle), which is also blue with pink side stripes, is gradually let down to its full length. Whilst this is being done the shivering and rustling of the feathers have increased to an alarming extent, the body of the bird has been lowered quite near the ground, the wings are extended sometimes almost to their full width, and the whole business is preceded and accompanied (particularly in the early stages) by a curious noise like the 'clacking' of two bones together, but how this noise is made I have never found out, though I should much like to know. When the bib has been extended to full length for a few moments the bird gathers himself together, moves forward about a yard, draws himself up to his full height (and it is surprising how high he can reach), keeps the bib fully extended in front of the hen for one moment, and then, within half-a-minute, horns and bib have entirely vanished and the cock is strolling about pecking grass, as if nothing unusual had happened.

"I am afraid anything I can say will quite fail to give an adequate idea of the extraordinary aspect of the bird whilst the display is at its height—indeed, I think any one coming suddenly upon the spectacle would scarcely believe they were looking at a bird, the spectacle is so demoniacal.

"So much for the conduct of the cock; but, I think, if carefully considered, the conduct of the hen is even more curious, or perhaps I should say more inexplicable, for she seems absolutely lacking in interest as to the display of the cock."

TEXT IDENTIFICATIONS

PAGE.	LINE.	
49	9	Himalayan Raven, *Corvus corax tibetanus* Hodgson.
49	16	Himalayan Griffon Vulture, *Gyps fulvus himalayensis* Temminck.
50	20	White-browed Bush-Robin, *Ianthia indica* (Vieillot.)
52	3	Magnolia, *Magnolia Campbellii* and other sp.
52	15	Paper Lilac, *Daphne* sp.
52	17	Primroses, *Primula petiolaris* Wall.
52	21	Orange-gorgeted Flycatchers, *Siphia strophiata* Hodgson.
55	9	Jungle Cat, *Felis chaus* Güldenstadt.

DETAILED DESCRIPTION

ADULT MALE.—Head, from anterior edge of nostrils back to the neck, jet black, broken only by two lines of orange feathers beginning just over the eyes and converging on the nape, and an irregular post-auricular patch of the same colour. Both the orange and the black feathers of the hind crown and occiput unite in forming a short, inconspicuous crest. Facial area covered rather thickly with short, black, velvety feathers. Chin, gular throat lappet and throat posterior to this, sparsely covered with longish, disintegrated feathers. Hind neck and entire mantle, bend of the wing and plumage of under parts orange-carmine. Remainder of upper surface chiefly dark olive-brown. The entire body plumage is characterized by a conspicuous terminal white ocellus bordered with black. The hind neck is free from these ocelli, which appear abruptly on the mantle as small but very distinct dots of silvery-white, shining against the crimson background. Even these crimson feathers show an abundance of black and buff barring on the basal portions of the feathers, and this rapidly increases as we proceed backward, pushing up the shaft toward the ocellus, until the crimson is restricted to two lateral subterminal patches. On the back and rump even this disappears, and we find a generalized pattern, strongly suggestive of that of the female and early plumages. On the back the central terminal shining white ocelli are small, only 2 to 3 mm. in diameter, but become larger and more diffuse on the rump and upper tail-coverts. All the dorsal plumage shows two large lateral olive ocelli bordered with black, which occupy about half of the visible portion of the feather. The background and narrow margin of the feather is a pale olive-buff, with a number of irregular black crossbars posterior to the ocelli.

The bend of the wing and anterior edge is plain carmine, but the wing-coverts are like the lower mantle, with the white ocelli rather diffuse and the lateral ocelli chiefly carmine. The tertiaries and inner secondaries show no carmine, but very large, well-marked olive ocelli, which in the outer secondaries fuse at the tip, replacing the white ocellus. The secondaries are dark olive-brown, irregularly barred with pale buff, changing to black on the primaries with about a dozen irregular buff bars.

The enlargement of the olive ocelli reaches an extreme on the upper tail-coverts, where, with the exception of very narrow marginal lines of buff and black, they occupy the entire visible area. The tail-feathers are brownish black, with the basal halves of the feathers mottled and barred irregularly with buff.

The ventral plumage is of the specialized mantle pattern, carmine with glistening white ocelli set in black. On the lower sides, belly, flanks, and under tail-coverts the

PLATE VIII

TRAGOPAN PLUMAGES

Tragopan satyra (Linnaeus)

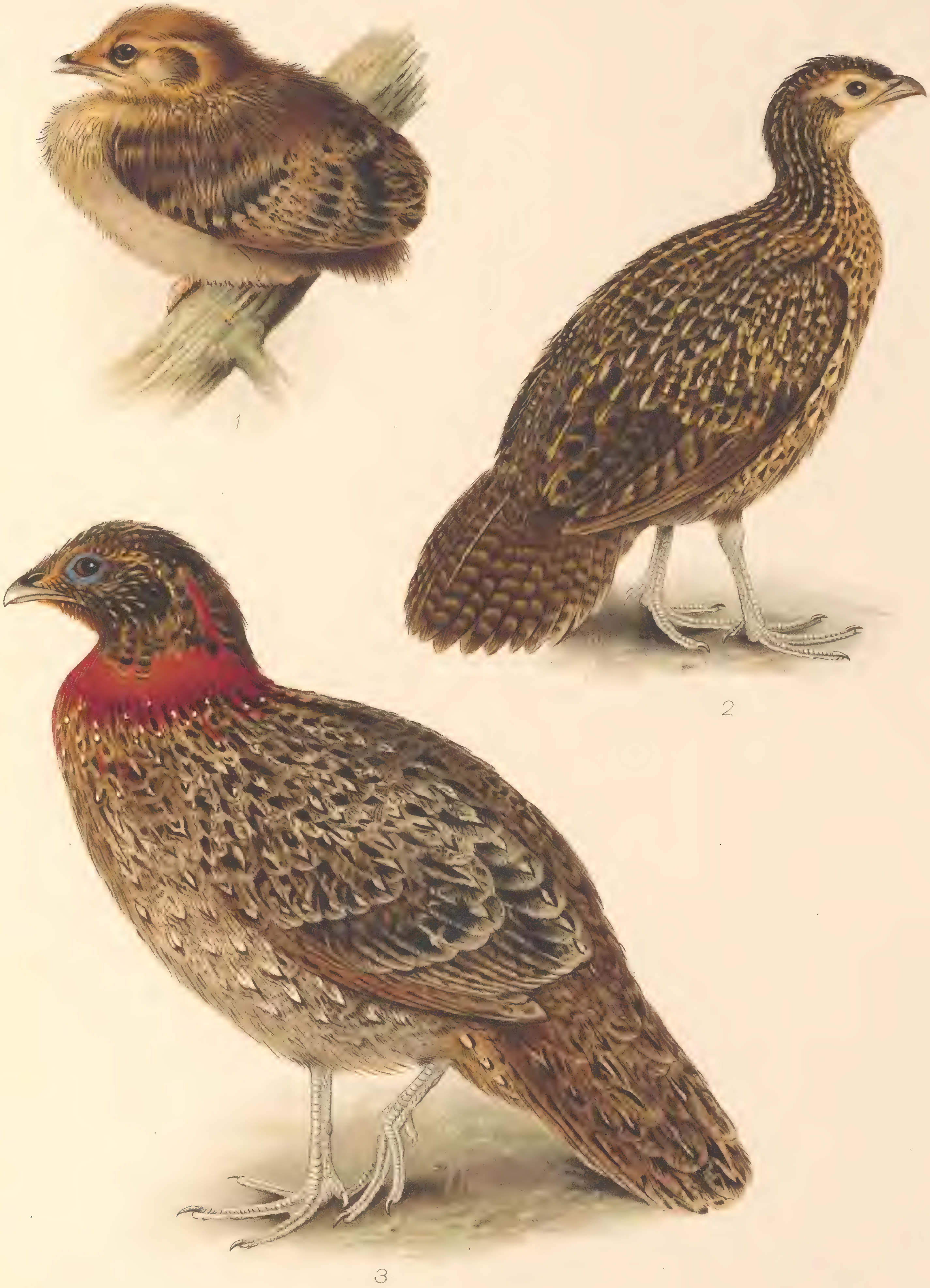
Tragopans, unlike Blood Partridges, do not acquire the adult plumage in the first year of their life.

Figure 1. The chick in the down plumage has a rich rufous head, the body being dark rufous above and pale yellow buff below. The wing feathers are well developed and the chick is able to fly a day or two after it leaves the egg.

Figure 2. A bird six weeks old has assumed full juvenile plumage, typical in pattern; a warm buffy background mottled and barred with black, with a conspicuous terminal, paddle-shaped shaft-stripe.

Figure 3. Birds in the first year plumage are quite uniform as to body, but if the moult has been late the head and neck will correspondingly be more adult in colour and pattern, as in the bird figured. Even a few days will make considerable difference in the pigment deposited, so that cocks of this age show a remarkable amount of variation.

PLATE VIII



H. Grönvold

TRAGOPAN PLUMAGES.

white ocellus expands over much of the terminal portion of the feather and becomes diluted to a pale silvery-grey. On none of the feathers, however, does the buff-and-black basal barring become visible.

Mandibles black, horn-coloured toward the tips; irides dark hazel-brown; legs and toes pale fleshy, becoming dull crimson at the breeding season and paling to a fleshy grey during the autumn and winter; claws brownish horn; the chin, upper throat and orbital area (even on the densely feathered portion) purplish blue. The gular wattle or lappet varies from a mere wrinkle to a length of 90 or 100 mm. during the breeding season. It is orange or salmon with transverse blue bars extending laterally inward from the margins. When retracted the blue predominates, the lighter colours being hidden in the wrinkles. The fleshy horns, invisible except during the periods of courtship, are brilliantly blue. Out of season they are about 25 mm. in length, lying inconspicuously among the crown feathers; when erected they may reach a length of 75 or 80 mm. The spurs, averaging 8 or 10 mm., are stout and blunt. The weight of adult males varies from 3 lb. 8 oz. to 4 lb. 10 oz.

Length, 671–722 (696); expanse, 811–881 (846); bill from nostril, 15–17 (16); wing, 253–266 (259); tail, 253–344 (298); tarsus, 82–95 (88); middle toe and claw, 72–79 (75) mm.

ADULT FEMALE.—Forehead and crown feathers light-centred, dark-margined, and with the tips more rufous as we proceed backward to the hind nape and neck, which are distinctly rufous.

From here, posteriorly over the upper plumage, we find a complex mottling with only two characters common to all portions; a pale buff or whitish central shaft-streak or patch, and a tendency to the formation of two black lateral ocelli near the terminal portion of the feather. Basally, almost all the feathers show a tendency to banding, black and pale rufous wavy crossbars succeeding one another. This pattern obtains on the flight feathers, continues strongly marked and of a warm rufous on the secondaries, but degenerates into mottling on the inner webs of the primaries. The lesser coverts near the bend of the wing are so rich in hue that they become almost crimson.

On the tail-coverts, while the ocelli are distinct, the shaft-patch has become concentrated into a very white, very small terminal streak. The rectrices show a number of shaded crossbars of various tones of rufous and warm buff.

The face, chin and throat are almost uniform yellowish white. The throat and upper breast resemble the dorsal plumage, but posteriorly the white centre increases rapidly in size, and presents the appearance of large, whitish, elongated spots framed in pale yellowish buff. The females show considerable variation among themselves, some darker, some more grey. When the latter colour appears, it is invariably upon the upper back that it is most conspicuous. The iris is brown; mandibles dusky horn; feet and legs greyish. Weight about 2 lb. 7 oz. The measurements are: length, 573; expanse, 741; bill from nostril, 13; wing, 233; tail, 193; tarsus, 66; middle toe and claw, 63 mm.

NATAL DOWN.—The chick may be described in brief as having a rich rufous head, the body very dark rufous above and pale yellow buff below.

The forehead is warm orange rufous, the hind crown somewhat darker, shading into a rich mahogany on the wing-coverts, back and the very long tuft of caudal down. The nape is indistinctly mottled with paler buff. The head is remarkably uniform in colour, the face and a superciliary line being pale yellow buff like the throat. The under parts are uniformly buff, the chin and throat quite cream-coloured and the remainder more grey in tone.

The wing feathers are extremely well developed at birth, and function in flight within a day or two after the chick emerges from the egg. They cover the entire back and project even beyond the caudal tuft of down which represents the tail at this period. The 1st to 7th primaries inclusive, of a three-day-old chick give the wing a total length of 71 mm. (the 7th having grown 43 beyond its sheath), whereas the bird itself is only 120 mm. in length. The 8th primary is still encased in its sheath, while there is no trace of the 9th and 10th. Eight secondaries are well to the fore, and one or two others of shorter length give a very adult and finished appearance to the tiny closed wing. All the flight feathers are dull dark brown, coarsely mottled on the outer webs with reddish buff, the pattern giving to the wing the appearance of four or five more or less distinct transverse bands.

The culmen is high and arched, quite like the adult, and the cere is feathered to the anterior edge of the nostrils. The culmen measures 6 mm. The other measurements of the chick are: tarsus, 23; middle toe and claw, 22 mm.

It is interesting that from the first there is a remarkable absence of down from the flights and coverts. The early precocious use of the wings soon strips away every shred except upon the more protected lesser coverts.

Except for general increase in size there is little change in the next week or two, except for the appearance of the scapulars, in two conspicuous lateral patches of feathers, mottled irregularly for much of the basal and central areas, but with the terminal third (the visible portion) showing a large central whitish stripe flanked by two more or less rounded black spots. Shortly after these, similarly patterned breast feathers appear through the down, and the juvenile plumage soon eclipses the body down. At the stage where the wing measures about 94 mm. we find that the 8th primary has gained tremendously upon its fellows, projecting from its sheath about 25 mm., while its next inner neighbour is only twice as long. No. 9 is only just visible as a tiny projecting point above the skin.

At this age the culmen measures 7 and the tarsus and middle toe 28 mm. each.

ONE-THIRD GROWN MALE.—A July bird of about six weeks is in complete juvenile plumage, except for the face, chin and throat, which still retain the nestling down. Although the entire dorsal surface seems to be completely clothed with mesoptile feathers, the plumage lifted anywhere shows active moult. The forehead and crown are moulted clean, but a sharp line extends along the side of the head, below which the immature down is unaffected. This downy section includes the lores, broad superciliary band of rufous down, the sparsely feathered face, the chin and the throat. The ear-coverts show a conspicuous patch of mesoptile feathers encroaching upon the down of the face.

On the crown and nape the feathers are wholly brownish black, with only a narrow terminal shaft-wedge of warm buff. From the neck backward, including the scapulars, back, rump, wing-coverts, tertiaries and innermost secondaries, fore neck, breast and sides we find an interesting pattern, changing in lesser details and hue, but keeping remarkably true to a single type, and characteristic, as we shall see, of the teleoptile plumage as well. This consists of a warm buffy background, mottled with black, with a conspicuous terminal paddle-shaped shaft-stripe of clear pale buff, flanked on each side with a rounded black ocellus. On the nape these ocelli first detach themselves from the solid black of the basal portion of the feathers; on the breast there are in addition two or even three pairs of spots forming rough transverse bands; while on the secondaries an ocellus is present only on the outer web. They reach their highest development on the tertiaries, where the neatly round black ocelli are accentuated by a surrounding ring of light buff. On the lower breast and belly the mesoptile pattern becomes rather obscured by a general paling and decrease of dark marking. The primaries and tail feathers only are free from this interesting mesoptile pattern, the former being dark brown with a notched band of rich rufous mottling on the outer webs, while the tail feathers show as many as eleven distinct, shaded, transverse bands, black and pale buff on a dark brownish buff background.

The bird at this stage has increased considerably in size, its measurements now being: length, 304; wing, 152; tail, 97; culmen, 10; tarsus, 41; middle toe and claw, 43 mm. The 9th and 10th primaries have at last shot out to a distance of 91 and 63 respectively, but the 8th has not quite completed its growth. The final autumn moult of the primaries is well under way. The 1st is almost full length; the 2nd only 68 out of the sheath, while No. 3 has just broken its sheath; 4, 5, 6, and 7 stand patiently waiting their turn. Although faded, they do not show unusual signs of wear, while the secondaries which still remain are in a sad state, frayed and torn as if they bore some special stress in the flight or other activities of the young bird. The renewal of these feathers is progressing as usual from without inward, three pairs being in various stages of simultaneous growth.

The tail shows no signs of renewal as yet, the innermost pairs being mesoptile and still firmly in place.

First Year Plumage.—Shortly after the attainment of the complete juvenile plumage, the general autumn moult begins, and although, unlike the blood partridge, this plumage resembles rather closely that which it replaces, yet it is as complete as though it reflected all the gorgeous tints of the fully adult males.

A bird shot in September shows almost the complete first winter plumage, except that the bird appears small, due to the fact that most of the feathers of the body, wings and tail are not full grown. In general the appearance of the male is now much more like the adult female than is the juvenile plumage. If we consider the two chief modes of variation of the adult females as excess of dark colour and of rufous, the young males will lie fairly between these extremes. In place of the clear, conspicuous shaft-streaks of the dorsal juvenile feathers we find a more confused mottling of the central area. The old feathers show decided fading, the warm buff having turned whitish grey, while the new incoming feathers restore the warmer tone. In the new plumage the two black, subterminal, round ocelli are as well marked as before, but the irregular mottling and vermiculation of the rest of the feather obscures all patterning and gives to the upper plumage a confused mingling of grey, warm buff and dark tones, the solid black being the only definite markings. On the middle and greater coverts the buff shaft-patch clears up and forms a fairly well-marked character. The new wing and tail feathers are similar to the body plumage in being more mottled and less definitely patterned than the previous plumage.

The moult of the primaries at this age is nearing its close. All the inner ones have been renewed and are full grown. No. 6 has almost reached its full length; No. 7 still lacks 25 mm.; No. 8 is sheathbound throughout its total length of 63 mm.; while Nos. 9 and 10 are the full-grown, clean juvenile feathers, which because of their delay are to have the honour of remaining unshed throughout the coming year. The rectrices are all in active growth, the outer ones having been last renewed.

The facial area, skin and throat are now covered with a dense growth of short, dirty-white feathers, those of the former area edged broadly with dark, while those of the chin and throat are plain. On the breast we find the same confusion of pigment and pattern, but on the belly a new pattern appears, the ventral ocelli, like those of the adult female, presaging the pearly ornaments of the adult cock bird. These are roundish central areas of white, showing conspicuously against the surrounding faintly vermiculated buff. In the young male the white is bounded distally by an irregular dark band, the remnants of the two dark ocelli of the rest of the plumage. In some individuals the spurs are quite precocious, and in September or October birds they may be considerably elevated above the surrounding tarsal scales. The September bird under consideration measures: bill from nostril, 12; wing, 241; tail, 157; tarsus, 68; middle toe and claw, 68 mm.

The two areas of delayed growth in the first winter moult of Tragopans are primaries 9 and 10, and the head and neck. As we have seen, the former are not distinguishable from their newly grown companions, and show no character of the juvenile flights. The effect of the delay of the latter region is to produce conspicuous results. If an individual bird grows rapidly and moults early and clean, we find in the first winter's cock a bird much like the female. But if for any reason the moult be delayed, and the internal maturing processes have a chance to begin their alchemy of pigment-synthesis which will result in the gorgeous and specialized colours of the adult cock bird, the incoming feathers of the head and neck are very different from those of the remaining, earlier-formed first winter's plumage. Thus is explained the great variation in birds of the first year. One finds all sorts of conditions existing in the region of the head and neck. Invariably the body, wings and tail are of the more primitive, female-like type, but joined to these the majority of first year males show heads of more or less dark hue, flanked by collars which range from a faint crimson stain to a brilliant scarlet ruff. Indeed, the stains, and faint, imperfect hints of the adult ornaments may sometimes be found over the entire plumage. In a large series of young birds scattered throughout many museums, the individuals are about evenly divided between those which have acquired the strictly conventional first year dress of their mothers, and those which are anteriorly precocious, showing a particoloured garb which is not pleasing, at least to our eyes. Thus is explained why birds of this group are so often shot in

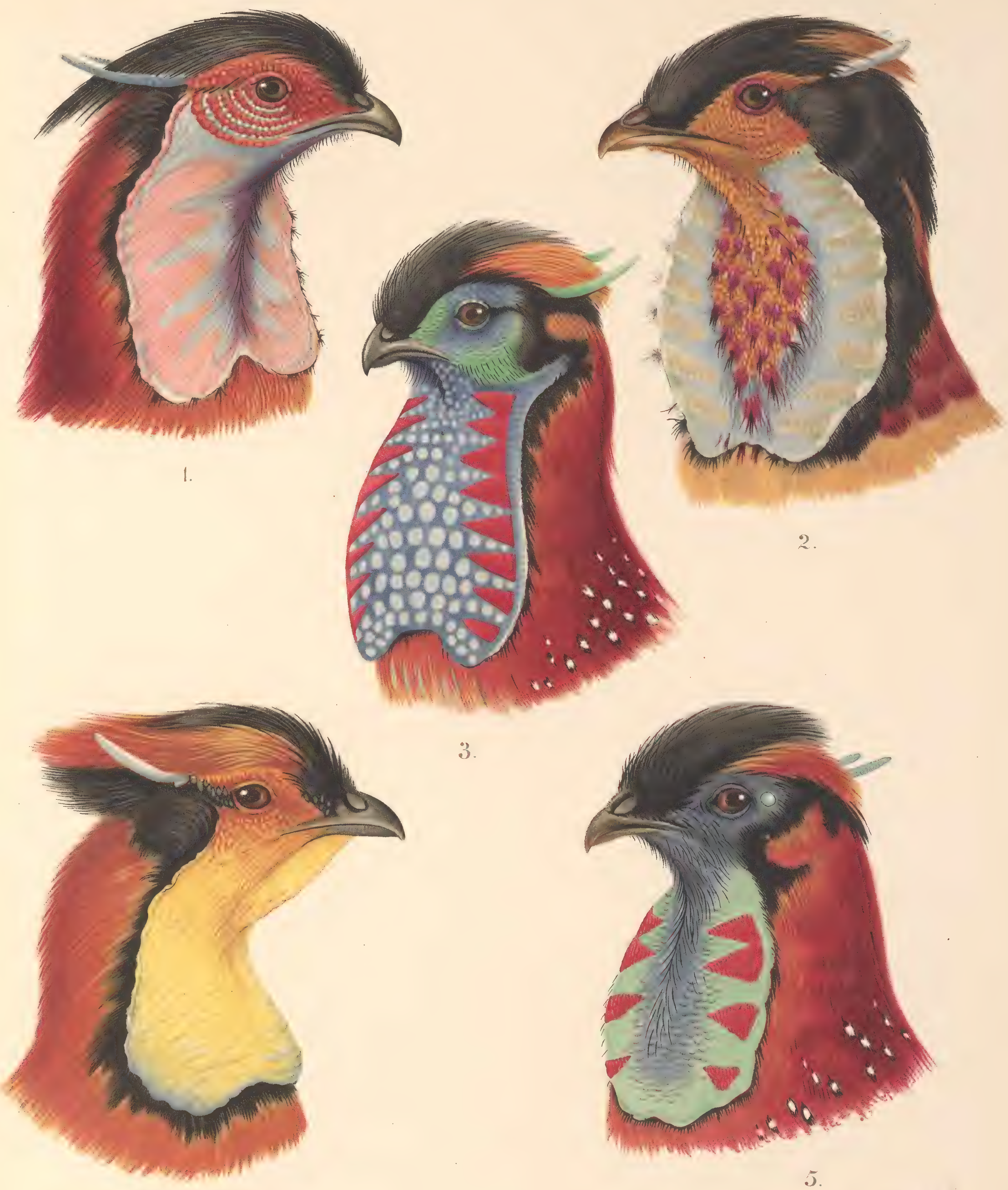
PLATE IX

WATTLES OF COCK TRAGOPANS

THESE wonderful structures come to their full development at the breeding season. At this, as at all other times, they are usually quite invisible, being drawn up to an inconspicuous fold of skin beneath the chin, hidden by feathers. At the climax of courtship the great apron of skin becomes distended and its remarkable pigments and patterns are momentarily displayed to their full expanse before the hen.

Figure 1. Wattle of Western Tragopan (*Tragopan melanocephalus*).
Figure 2. Wattle of Cabot's Tragopan (*Tragopan caboti*).
Figure 3. Wattle of Temminck's Tragopan (*Tragopan temmincki*).
Figure 4. Wattle of Blyth's Tragopan (*Tragopan blythi blythi*).
Figure 5. Wattle of Satyr Tragopan (*Tragopan satyra*).

PLATE IX



1. 2. 3. 4. 5.

WATTLES OF COCK TRAGOPANS.
)

December or May, apparently in full moult and yet with every feather full grown, and not a blood sheath upon the body.

Occasionally upon typically first winter breast plumage we may find several scattered crimson feathers with the pearl-grey spot of the adult. This results from the accidental loss of a feather near the time of final moult.

When we consider the tremendous difference in the various altitudes covered by Tragopans, and that by some trivial fright or other cause a single flight may carry them thousands of feet downward, we can see good cause for the great variation in the time of moult, with its attendant consequence of retardation or advance in pigment formation.

Reviewing the plumages as a whole, we find an interesting sequence in the male bird: (*a*) a down plumage of definite regional patterns; (*b*) a juvenile plumage of definitely patterned feathers; (*c*) a first winter's plumage of very generalized, confused, female-like coloration; (*d*) an adult plumage of specialized regional and feather colour and pattern.

EARLY HISTORY AND SYNONYMY

Long before the magic year of 1758, whence date our first binominal scientific names, the Satyr Tragopan was known and written about. In 1750 George Edwards gives us a very quaint, and perhaps the first, account of the Horned Indian Pheasant, as he calls it, which he knew only from a head preserved in spirits and a coloured "draught sent from Bengal." This latter seemed to him so truthfully to represent the appearance that he copied and published it in his "Natural History of Birds." We gain an excellent idea of his conscientious mode of work from a few lines in regard to this Indian sketch: "The tail appeared, in the original draught, a little bushy at the end, as if broken off by being kept in a cage or coop; it was in length of the proportion I have here given it; but I imagine this most rare and curious bird, in its perfection, has the tail something if not a great deal longer; so that I have left it doubtful by casting it behind a tree. I believe this capital bird has not been described by any author. . . . The original drawing is underwrit the Napaul Pheasant."

Edwards gave it no scientific name, but Brisson gave it three, and in his elaborate parallel French and Latin calls it *Phasianus bengalensis cornutus*. In 1766, in his 12th edition of "Systema Naturae," Linnaeus calls it *Meleagris satyra*, the latter name being the one by which it is known to-day.

Tragopan satyra

Horned Indian Pheasant Edwards, Nat. Hist. Birds, III. 1750, pl. 116.

Phasianus bengalensis cornutus Brisson, Orn., VI. 1760, App. p. 14.

Meleagris satyra Linnaeus, S. N., I. 1766, p. 269; Latham, Ind. Orn., II. 1790, p. 619; Griffith, ed. Cuv., III. 1829, pl.

Le Napaul ou Faisan cornu Buffon, Hist. Nat. Ois., II. 1771, p. 362.

Phasianus cornutus Müller, Suppl. Linn. S. N., 1776, p. 125; Stephen, in Shaw's Gen. Zool., XI. 1819, p. 239.

Horned Turkey Latham, Gen. Syn., II. Pt. II. 1783, p. 680; id. Suppl., I. 1787, p. 203.

Penelope satyra Gmelin, S. N., I. Pt. II. 1788, p. 733; Bonnat, Tabl. Encycl. Méth., I. 1791, p. 170, pl. 84, fig. 1.

Phasianus satyrus Temminck, Pig. et. Gall., II. 1813, p. 349; III. 1815, p. 672; Vieillot, N. Dict. d'Hist. Nat., XI. 1817, p. 39; id. Gal. Ois., II. 1825, p. 23, pl. 206.

Horned Pheasant Latham, Gen. Hist., VIII. 1823, p. 208.

Tragopan satyrus Cuvier, Règ. Anim., I. 1829, p. 479; Gray in Griff. ed. Cuv., III. 1829, p. 31; Gould, Cent. B. Himal., 1832, pl. 62; Jardine, Nat. Lib. Orn., III. 1834, p. 222, pl. XXIV.; Temminck, Pl. Col., V. 1834, pls. 13, 14 [Nos. 543, 544]; Guérin, Icon. Reg. Anim., Ois., 1829–38, p. 26, pl. 43, fig. 4; Hodgson, in Gray's Zool. Misc. 1844, p. 85.

Satyra satyra Lesson, Dict. Sci. Nat., LIX. 1829, p. 196; id. Traité d'Orn., 1831, p. 493.

? Phasianus nepaulensis Gray, in Griff. ed. Cuv., III. 1829, p. 29.

Satyra pennanti Gray, Ill. Ind. Zool., I. 1830–32, pl. 49.

Satyra lathami Gray, Ill. Ind. Zool., I. 1830–32, pl. 51; Gray, List of Birds, Pt. III. Gall., 1844, p. 28.

Phasianus melanocepkalus Gray, Ill. Ind. Zool., I. 1830–32, pl. 47.

Satyrus cornutus Schinz, Nat. Abbild. Vög., 1833, p. 252, pl. 98.

Satyra nepaulensis Gray, Ill. Ind. Zool., II. 1834, pl. 40.

Tragopan melanocephalus Jardine, Nat. Lib. Orn., IV., 1834, p. 226, pl. XXVII.

Ceriornis macrolophus Swainson, Class. Birds, II. 1837, p. 341.

Satyra cornuta Gray, List of Gen. Birds, 1841, p. 78.

Ceriornis lathami Gray, Gen. Birds, III. 1845, p. 499.

Ceriornis satyra Gray, Cat. Hodgs., ed. I. 1846, p. 125; Blyth, Cat. Mus. As. Soc., 1849, p. 240; Sclater & Wolf, Zool. Sket., 2, 1861, pl. 39; Jerdon, Birds Ind., III. 1863, p. 516; Sclater, List of Phas., Proc. Zool. Soc. 1863, p. 122; Gray, List Gallinae Brit. Mus., 1867, p. 40; Irby, Ibis, 1868, p. 234; Beavan, Ibis, 1868, p. 379; Gould, Birds As., VII. 1868, pl. 49; Bulger, Ibis, 1869, p. 169; Gray, Hand-List Birds, II. 1870, p. 262; Sclater, Proc. Zool., Soc., 1870, p. 164; Elliot, Mon. Phas., I. 1872, pl. 22; Murie, Proc. Zool. Soc., 1872, p. 730, pls. LX., LXI.; Hume, N. & E. Ind. Birds, 1873, p. 521; Marshall, B. Nest. Ind., 1877, p. 59; Hume & Marshall, Game B. Ind., I. 1878, p. 137; Scully, Stray Feathers, VIII. 1879, p. 343; Sclater, Proc. Zool. Soc., 1879, p. 117, pl. VIII. fig. 4; Oates, ed. Hume's Nests and Eggs, III. 1890, p. 409; Smith, Avic. Mag., (3), III. 1912, p. 153; Jamrach, Avic. Mag., (3), VI. 1915, pp. 126, 159.

Tragopan satyra Ogilvie-Grant, Cat. Birds Brit. Mus., XXII. 1893, p. 271; Ogilvie-Grant, Hand-book Game-birds, I. 1895, p. 220; Blanford, Fauna Brit. India, Birds, IV. 1898, p. 99; Oates, Game-birds, I. 1898, p. 241; Nehrkorn, Katalog der Eiersammlung, 1899, p. 192; Sharpe, Hand-list Birds, I. 1899, p. 33; Oates, Cat. Eggs Brit. Mus., I. 1901, p. 50; Ghigi, Mem. R. Acc. Sci. Inst. Bologna, (5), X. 1903, pp. 394, 404, 406; Walton, Ibis, 1906, p. 247; Smith, Avic. Mag., (3), I. 1910, p. 225; Finn, Game-birds India and Asia, 1911, p. 28; Beebe, Zoologica, I. No. 15, 1914 p. 269.

WESTERN TRAGOPAN

Tragopan melanocephalus (Gray)

Names.—Specific: *melanocephalus*, from the Greek *μέλας* black, and *ϰεφαλή* head, having a black head. English: Western or Black-headed Tragopan, Simla Horned Pheasant, Hasting's Pheasant, Argus, Jewar. French: Tragopan à tête noire. German: Jewar. Vernacular: Jewar (Garhwal); Jaghi (Bussahir); Sing-Moonal (Hindustani, W. Himalayas); Jeejurana [male], Bodal [female] (Kullu, Mandi, Sukeyt); Fulgoor (Pahari Hindi, Chamba).

Brief Description.—Male: Head and lower crest black; nape and side neck deep red; upper breast bright orange; upper parts black, mottled with pale buff; lower parts chiefly *black*; above and below (except on head, nape, breast, primaries and tail feathers) conspicuously spotted with white.

Female: Above dark ashy grey, vermiculated and spotted with black, with narrow white shaft-stripes on crown and back. Mantle rufous buff. Below cold, grizzled, pale, ashy grey, each feather with a conspicuous white shaft-stripe, bordered with black.

Type.—From Almorah, described by Gray in Griffith's edition of Cuvier, in the year 1829. The type is now in the British Museum.

Range.—North-western Himalayas, from Garhwal to Kashmir and Laddakh.

THE WESTERN TRAGOPAN IN ITS HAUNTS

Lying at full length on a mossy shelf projecting from a long mountain slope, I could see through a wind-break in the forest of oaks and birches, the glistening, uneven edge of snow which lay between Garhwal and Tibet. Behind me the steeply rising slope shut off all view; only beneath and to the right was there a free field of vision. I had lain under my green cloth blind for two hours and had seen much of interesting wild life. As the afternoon drew on, the dark line of shadow crept slowly from the valley far below, up, up the mountain side to my right. The slope was steep and rocky, and the vegetation which clung to its face dwarfed and scanty. Idly scanning the cliffs with my glasses, I saw a distant spot detach itself from the shadows of the rugged cliff and move slowly along. A quick turn of the focusing screw brought a splendid serow into the field. Steadied on a bit of rock, the glasses showed even the elongated pupils in his glassy, yellow eyes. He walked where a man would have perished at a step; nay, more, he nibbled now and then from some succulent tuft of herbage, and once, balanced on what seemed a hand's breadth of crag, he stretched his neck and scratched his ear with a hind hoof! Then he performed a miracle. Without hint or crouch, he dropped stiff-legged for what seemed at least twenty feet sheer down the face of the cliff, landing lightly on the narrowest of ledges, where he fed for a few minutes. It was the sort of thing a bird might have done, but I never realized that any four-footed creature could so juggle with gravitation and live. Then he dropped again, this time not more than twice his height, perhaps eight feet, and passed around an angle of rock out of sight.

A pair of swifts which apparently had a nest in a lightning-scarred hollow trunk near by, were joined by a third about this time, whereupon a terrific battle ensued, the combatants falling almost at my elbow in their fury. And thus, one after another, came the actors on this splendid stage, while the unsuspected audience of one, attended with breathless attention and interest, but forbore to applaud.

Over the little patch of forest grass in front, shadows now and then passed, revealing lammergeiers or vultures, and once a nutcracker came and preened his plumage for five minutes in a tree down the slope, close to the level of my eyes.

Then a whirr of wings came from behind, and a wonderful cock Tragopan, the Western bird, flew straight overhead into the nutcracker's oak. For a moment after alighting he stood motionless, his keen eyes scanning every detail within view. Fortunately I had been watching the nutcracker, so the imperceptible shift of the glasses to the left was unobserved by the newcomer, who was facing directly away from me. My heart thumped wildly against the mossy rocks, and in my excitement it seemed as if my pulse must be audible even to the bird.

For at least ten minutes I watched this glorious creature, so close that not a feather or a spot was lost. When satisfied all was well, he began to preen plumage, wings and tail, balancing sometimes in most awkward positions on the branch, but constantly coming back to "attention" for a fraction of a second, before again burying his head within his feathers. A final ruffling and thorough shake of the whole body settled his plumage to his satisfaction. It also loosened a large body feather, which fell out and eddied slowly to the ground.

Then the Tragopan began to search the crevices of the bark and the strands of moss near by, now and then tearing off an entire skein and dropping it again. All this time he kept up a contented conversation with himself through closed bill—a low, murmuring, running chuckle, brimming with good nature. I have never heard anything like it from a captive bird, and considering it as a vocal utterance of a certain mental state, I can compare it best to the *song* of a domestic hen—that drowsy *waaa-waaaaaaaak! waaaak! waaaak!* which she utters when leisurely searching for food. It seemed the epitome of wild Tragopan contentment: another day had passed, food had been found, dangers avoided, a safe roost attained. The bird settled at last on a higher branch, not far from the trunk, where he was partly concealed from my view and here, as the shadows deepened, he squatted down. I did not wish to disturb him, so tried the experiment of first attracting his attention by slow movements. These made him crouch only the flatter, and I crawled off backward on all fours, enfolded by my green observation tent-cloth, with glasses swung round my neck. My last view of the bird silhouetted against the distant yellow sky, was of a head and neck drawn out to their longest, while keen eyes lost not a movement. Some dead branch crashed to the ground in the forest far below, and the bird's head turned in that direction. I slipped away behind the nearest trunks and left the Tragopan to the solitude of its lofty oaken perch, watching the day slowly die and the valley fill with the thick gloom of night; the cold, breathless summer night of the Garhwalese Himalayas.

GENERAL DISTRIBUTION

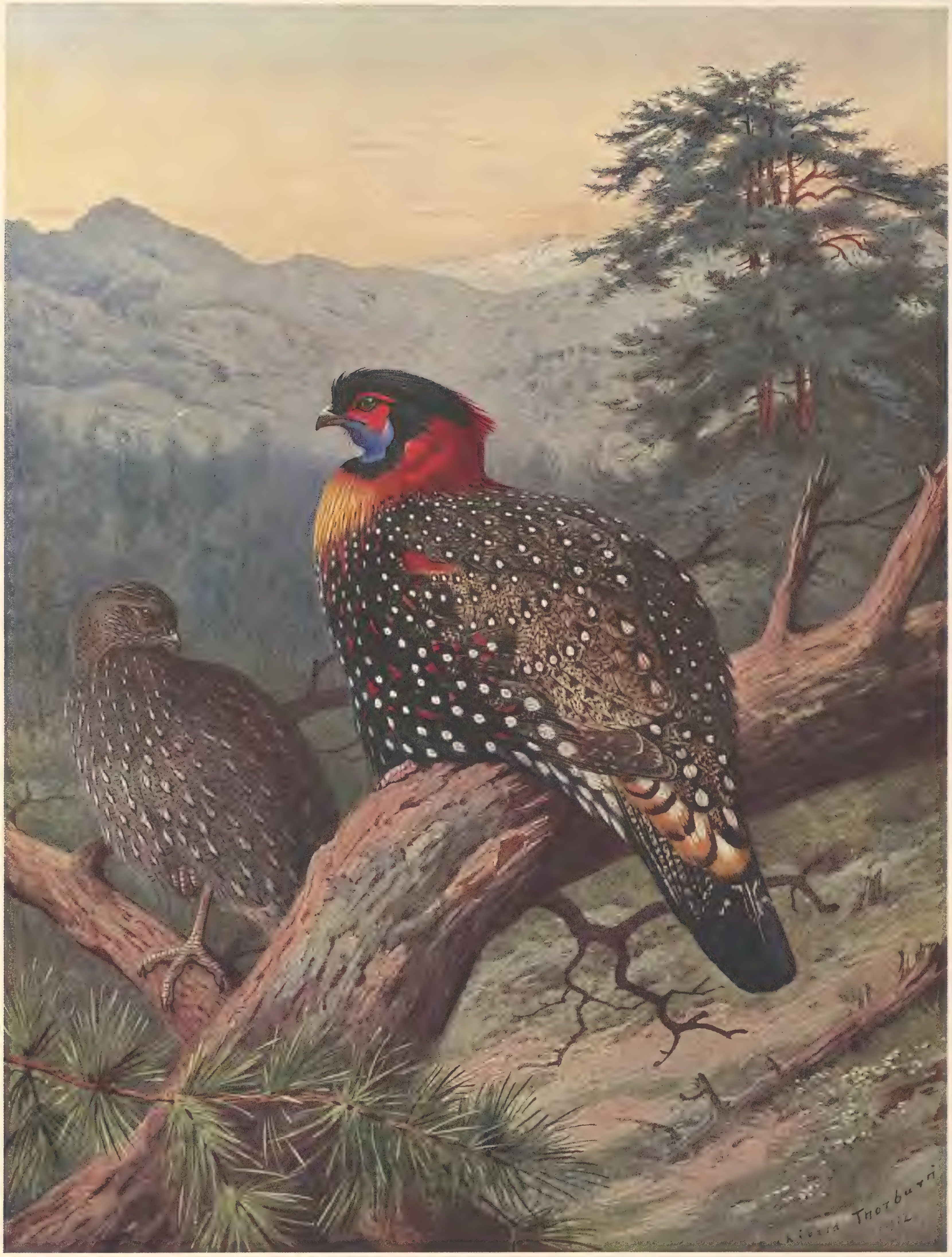
This species makes its appearance only a few miles beyond the western limit of the satyr tragopan's range, in native Garhwal. In fact, it is said that the ridge between

WESTERN TRAGOPAN

Tragopan melanocephalus (Gray)

In the mountain forests of the Western Himalayas lives this great bird, its black and crimson plumage covered with a shower of silvery stars. Its cry echoes through the gorges of Kashmir and the tumbled masses of mountainous Garhwal. A dozen are sometimes found together, and throughout the winter they keep within calling distance of one another. They are fond of the buds of trees, and thus can find sustenance even when the ground is covered deep with snow.

PLATE X


Thorburn
1912

WESTERN TRAGOPAN.

the Kattor and Bhilling Rivers marks its oriental limit. From here it is found along most of the middle wooded ranges of the Himalayas to the north-west, well into Kashmir. The great sweep which the Indus River makes in this border state marks the eastern boundary of this Tragopan, as far as we know at present. Within this fluviatile curve it has been recorded from Hazara on the east and from Laddakh in the north. It lives at about the same altitudes as the satyr tragopan. It has recently become very rare in most parts of Kashmir, but occurs in Poonch and Kistwar.

GENERAL ACCOUNT

Several score of years ago Mr. Wilson published an account of the habits of the Western Tragopan, or "Jewar," as he called it, a more intimate and complete history than any later record. In fact, in the intervening years but little has been added to our knowledge of the life history of this bird. I shall give his account and follow it with the observations I was able to make.

"Except where an isolated village is situated high up in a densely wooded locality and surrounded by thick forest, the Jewar is seldom or never found near the habitations of man, but frequents the darkest and most solitary parts of the woods, where it is not often subject to disturbance; and keeps so still and secluded in their shady recesses, that not one in twenty of the inhabitants of the nearest villages ever sees one, except when caught or killed by a shikari.

"In autumn and winter its haunts are in the thickest parts of the forests of oak, chestnut and morenda pine, where the box tree is abundant, and where, under the forest trees, a luxuriant growth of 'ringal,' or hill bamboo, forms an underwood in some places almost impenetrable.

"They keep in companies of from two or three to ten or a dozen, not in compact flocks, but scattered widely over a considerable space of forest, so that many at times get quite separated, and are found alone.

"In places where seldom disturbed, the whole lot are sometimes found within a compass of twenty or thirty yards, while, where often subject to intrusion, they get scattered and keep in ones and twos in different quarters of the forest, but if left undisturbed for a week or two, they will again collect together. They seldom forsake entirely a regular resort, however much disturbed, but get so shy and wary that it is very difficult to find, and almost impossible to shoot them. Here they pass the winter months, seldom wandering away from the particular quarter they have chosen for a resort, to which they return year after year; and while there located, if not disturbed, never leave it to any distance, though many other parts of the wood are exactly of the same character.

"If several lots are in the forest, each lot appears to have its own favourite quarter, and never intermingles with the others.

"The trees furnishing them with a sufficiency of food, though the ground be covered with snow many feet in depth, the severest storms do not, speaking of the species generally, cause them to change their locality. After a severe fall of snow, a few occasionally leave for a time their usual haunts, if in a very bleak quarter, or at any considerable elevation, and are found in places widely differing, as small patches of forest on a bare, exposed hill side, narrow wooded ravines, patches of low brushwood and jungle, and anywhere where the ground is sheltered from the sun by trees and bushes. Sometimes one is found in a similar situation in fine weather, probably driven out of its retreat by an Eagle or Falcon ; but these are rare exceptions, and they soon again return to their regular resorts.

"At this season, except its note of alarm when disturbed, the *Jewar* is altogether mute, and is never heard of its own accord to utter a note or call of any kind, unlike the rest of our Pheasants, all of which occasionally crow or call at all seasons. When alarmed, it utters a succession of wailing cries not unlike those of a young lamb or kid, like the syllables 'waa, waa, waa,' each syllable uttered slowly and distinctly at first, and more rapidly as the bird is hard pressed or about to take wing.

"Where not repeatedly disturbed, it is not particularly shy, and seldom takes alarm till a person is in its immediate vicinity, when it creeps slowly through the underwood, or flies up into a tree, in the former case continuing its call until it is again stationary, and in the latter, till it has concealed itself in the branches. If several are together, all begin to call at once, and run off in different directions, some mounting into the trees, others running along the ground.

"When first put up, they often alight in one of the nearest trees, but if again flushed, the second flight is generally to some distance, and almost always down hill. Their flight is rapid, the whirr peculiar, and, even when the bird is not seen, may be distinguished by the sound from that of any other.

"Where their haunts are often visited, either by the sportsmen or the villagers, they are more wary ; and if such visits are of regular occurrence, and continued for any length of time, they become so in a very high degree, so much so that it is impossible to conceive of a forest bird more shy or cunning. They then, as soon as aware of the presence of any one in the forest, after calling once or twice, or without doing so at all, fly up into the trees (which, near their haunts, are almost all evergreens of the densest foliage), and conceal themselves so artfully in the tangled leaves and branches that unless one has been seen to fly into a particular tree, and it has been well marked down, it is almost impossible to find any of them.

"In spring, as the snow begins to melt on the higher parts of the hill, they leave their winter resorts, and gradually separate and spread themselves through the more remote and distant woods, up to the region of birch and white rhododendron, and almost up to the extreme limits of forest.

"Early in April they begin to pair ; and the males are then more generally met with than at any other period ; they seem to wander about a great deal, are almost always found alone, and often call at intervals all day long. When thus calling, the bird is generally perched on the thick branch of a tree, or the trunk of one which has fallen to the ground, or on a large stone. The call is similar to the one they utter when disturbed, but is much louder, and only one single note at a time, a loud energetic 'waa,' not unlike the bleating of a lost goat, and may be heard for upwards of a mile. It is uttered at various intervals, sometimes at every five or ten minutes for hours together, and sometimes not more than two or three times during the day, and most probably to invite the females to the spot.

"When the business of incubation is over, each brood, with the parent birds, keeps collected together about one spot, and they descend towards their winter resorts as the season advances; but the forests are so densely crowded with long weeds and grass, that they are seldom seen till about November, when it has partially decayed, and admits of a view through the wood.

"They feed chiefly on the leaves of trees and shrubs; of the former, the box and oak are the principal ones; of the latter, ringal and a shrub something like privet. They also eat roots, flowers, grubs and insects, acorns and seeds, and berries of various kinds, but in a small proportion compared with leaves. In confinement they will eat almost any kind of grain.

"Though the most solitary of our Pheasants, and in their native forests perhaps the shyest, they are the most easily reconciled to confinement; even when caught old they soon lose their timidity, eating readily out of the hand; and little difficulty is experienced in rearing them.

"The sportsman desirous of getting the Jewar should endeavour to learn from the shikaris and people of the place whether any are to be found in the neighbourhood before he commences what may otherwise prove a toilsome and unsuccessful search. You may hunt over very likely forests without finding a single bird, and without previous information there is nothing for it but to work through every part of the wood. In autumn and winter, having learnt that the birds *are* about, he should proceed to some well-wooded locality, and after taking a survey of the general aspect of the forest, direct his way to some well-wooded ravine or hollow, where the tapering summits of the morenda pine may be seen towering above the rest of the forest trees, and the dense and closely wooded character of the forest shuts out from a distance all view of the ground.

"Dogs are not necessary, but can do no harm if properly under control.

"Should he pass near a spot where any of the birds are, he will soon be made aware of their vicinity by their peculiar call, which they will invariably utter on his approach.

"If they begin calling while he is at a distance, or the underwood prevents their being seen, though near, he should press on them as quickly as possible, and endeavour to force them to rise, or try and get a shot while one is passing over some exposed spot, before they conceal themselves, in which they have few equals. If they fly into the trees, the particular tree into which one has flown must be well marked down, and, if possible, the particular part, or it will be difficult to find it. From the thick and tangled character of the woods where they generally resort, crowded and entangled with multitudinous trunks and branches of trees, and dense clusters of tall ringal, it is seldom that a fair shot can be got at them on the wing, and the only alternative is to shoot them in what some will perhaps deem an unsportsman-like way, on the ground, or in the trees.

"A lot once found in any part of the forest, they may, to a certainty, be found again daily at the same spot, or in its immediate vicinity, but each day they will become more shy and wary, and it is useless to hunt for them on the same ground many days successively, as, after being disturbed once or twice, it will be next to impossible to get a shot, though many birds may be found. They will be scattered singly in widely distant places; some will keep in the trees altogether, one now and then flying off close above the sportsman's head, but so suddenly and rapidly as to leave little chance of his getting a shot at it; and many, as soon as aware of the sportsman's presence in the wood, will, without waiting for his approach, conceal themselves so artfully as to leave only a bare possibility of his ever finding them.

"Even if the particular tree into which one has been seen to fly is immediately approached, one may stand for an hour under it, and examine almost every leaf and branch without being able to discover the bird, and should one even succeed in doing this, one is still often disappointed in getting a shot, as they seem to keep their eye fixed on your movements, and to become aware of the very moment they are discovered, darting off before the gun can be put to the shoulder.

"In spring, which is the season most generally chosen by the sportsman for excursions in the interior, he will have a better chance of finding them than in autumn, as then they are not so restricted in their resorts, but are distributed all over the forests, and the males do not so much covet concealment. They should now be sought for in the higher parts of the forest, where the birch tree begins to make its appearance, and it is advisable to sit and listen at intervals for their call. On hearing it, the sportsman should proceed as quickly and as noiselessly as possible to the quarter from whence the sound proceeded, listening at times for a repetition of the call to guide him to the exact spot. The bird will generally be found on some exposed spot where a nice pot shot may be had. Great caution must be taken, particularly when getting near, as, if once disturbed, there is little chance of finding the bird again that day.

"The Jewar roosts in trees, and in winter, perhaps for warmth, seems to prefer the low evergreens, with closely interwoven leaves and branches, to the larger trees which overshadow them."

On the whole I think that Wilson's account is reliable, but drawn in part from native hunters. I hardly see how he could know that the same birds return year after year to exactly the same locality, and while it is probable that they do, one can hardly accept it as a proven fact. From talks which I had with many sportsmen and natives I think that the Western Tragopan is much more of a solitary bird than Wilson gives us to understand. All which I saw were alone, and as it is true that when a flushed bird calls, all within hearing distance answer, I could tell with some degree of certainty the proximity of the nearest bird, which was usually a considerable distance away. This and some other discrepancies, however, may be partly the result of the bird's distribution over a large, broken territory, so the habits of the individuals on one range may well differ slightly from those of others at a distance.

I found these Tragopans feeding on newly sprouted leaves, and from the accounts of several sportsmen, I believe that such vegetable matter forms their principal diet.

This species resembles the satyr so closely in its general habits, and is so nearly related to that tragopan, that it is very probable the category of vocal utterances is similar. The *waa* which Wilson thinks is an invitation to the females, doubtless corresponds to the challenge call of the satyr, while the mating call of the Western Tragopan, which is probably much lower, has not yet been recorded.

Wilson unquestionably errs when he states that, although the most solitary and shy, these birds are of all Tragopans the most easily reconciled to captivity, and that they may be reared with little difficulty. Like the statements of so many early writers, this statement has been widely copied, but never authenticated. In India I was told by four different people who had tried to keep these Tragopans alive, that while it was true that the wild-caught individuals soon became tame, yet none showed an inclination to breed, and all died within a short time. No living Western Tragopan has thus far reached America, and though a few have been kept from time to time in various continental aviaries, the London Zoological Gardens has had only two birds, received in 1882, both of which lived a little more than two years. Jamrach records that of the total of forty birds which he imported, all reached Europe alive.

As far as I know there is no account of the courtship display of the Western Tragopan, but as it possesses the typical fleshy horns and lappet we may be certain that this does not materially differ from the display of Temminck's.

One nest with eggs has been recorded from the province of Hazara (*circa* N. Lat. 34°; E. Long. 73°) by Captain Lantour. The nest of the "Argus," as he calls it, using one of the colloquial misnomers of sportsmen, was found on May 25, 1869, and contained six eggs, four of which are now in the British Museum. Captain Lantour was shooting on a range of hills of from eight to eleven thousand feet altitude, covered with pine forest. The "Argus" or Western Tragopans were plentiful about three-quarters up toward the hill-tops in the vicinity of snowy nullas and rocky landslips, where there was a considerable undergrowth.

When he came across the nest, he was on the lookout for pheasants, but on the steep slope had given his gun to his shikari, when a bird flew up almost at his feet. This was in a pine forest, at a place where an old landslide had swept away all the pine trees, their place being taken by small bushes and hazel-like shrubs. The nest was on the ground, and was carelessly built, very roughly formed of grass, small sticks, and a few feathers.

A very careful description of these eggs is given by Hume, who says that they "are more or less elongated ovals, considerably compressed towards the small end. They are, as a whole, of very much the same length, but a good deal slenderer than the eggs of the Moonal. The shell is fine, but almost absolutely devoid of gloss. Looked at from a little distance, they appear to be of a uniform colour and devoid of markings, and seem to vary from a pale *café au lait* to a dull reddish buff; looked at closely they are seen to have a somewhat lighter ground colour, excessively finely and minutely freckled and spotted with a somewhat darker shade. They are the least glossy of all the true game bird's eggs that I know, and in shape and texture, though not in tint, remind one not a little of those of the King Curlew and White Ibis, and other birds of that family. In length they vary from 61 to 65 mm., and in breadth from 42·5 to 43·5 mm.; but the average of the six eggs is 64 by 43 mm." A set of these eggs which I examined in Calcutta, collected June 4th in the Pir Pangal, Kashmir, averaged smaller in size. Two of these were of a dull, pale ochre, muddied by a very faint, even mottling of a slightly darker shade. One egg shows a smear of dark ochre in one place, terminating a lighter area.

Now, this nest is of especial interest for two reasons: first from the fact that it is a nest at all, since without exception the Galliformes of the Old World make no nest, but merely deposit their eggs upon the ground. If this be among dead leaves and other debris, a hollow may be scraped out, or is soon moulded by the pressure of the eggs and sitting bird. The Tragopans, of all the groups of pheasants, are most arboreal, and hence parallel the curassows and guans of the Neotropical region. As I shall show, in the case of the Cabot's and Temminck's tragopans, their nesting habits in captivity strongly suggest that birds of this genus build nests of their own in trees, or at least off the ground.

No concrete proof of this has been forthcoming, however, until I was fortunate enough to stumble upon circumstantial evidence of so positive a nature that I include it in detail without hesitation. In this, as in my account of the roosting bird, the Tragopan entered upon the scene wholly unexpectedly.

How often it is that Nature will suddenly exhibit to us a hint of some long-desired mystery when we least expect it, when perhaps we are wholly absorbed in something else—an unexpected gleam into the tail of our eye—and yet for day after day hold herself aloof and sphinx-like, when we make our most concentrated attempts to force her secrets.

In western native Garhwal I had set up my observation tent on a sloping hillside of pine. In this case, I had placed it under and within the dense sweeping branches of a young deodar, so that it made a formless mound of green, indistinguishable from the mass of dark needle foliage about it. Here I left it for three days, and then entered it one morning with the intention of observing more closely some cheer pheasants, which were accustomed to pass over this slope twice a day. An hour after I had begun my vigil, I cut a new observation slit in the rear, for the purpose of finding the author of a sweet, silvery thread of warbling notes. A moment before, they had been uttered within a foot of the tent, and now I found the bird had flown to the short, depressed branches of a silver spruce, forty feet up, and not far away. The activity of the little bird, whatever it was, prevented my identifying it; but, in searching for it, I discovered a rough mass of sticks, lodged close against the trunk, and partly overhung and concealed by several of the silvery-green needle-fans of this splendid conifer. I marked it down as an object for examination when I should leave the tent, and, after the usual few minutes of exercise and massage within my little green mound, by which alone I could compel my aching limbs to endure the hours of cramped posture, I returned to my survey of the hillside.

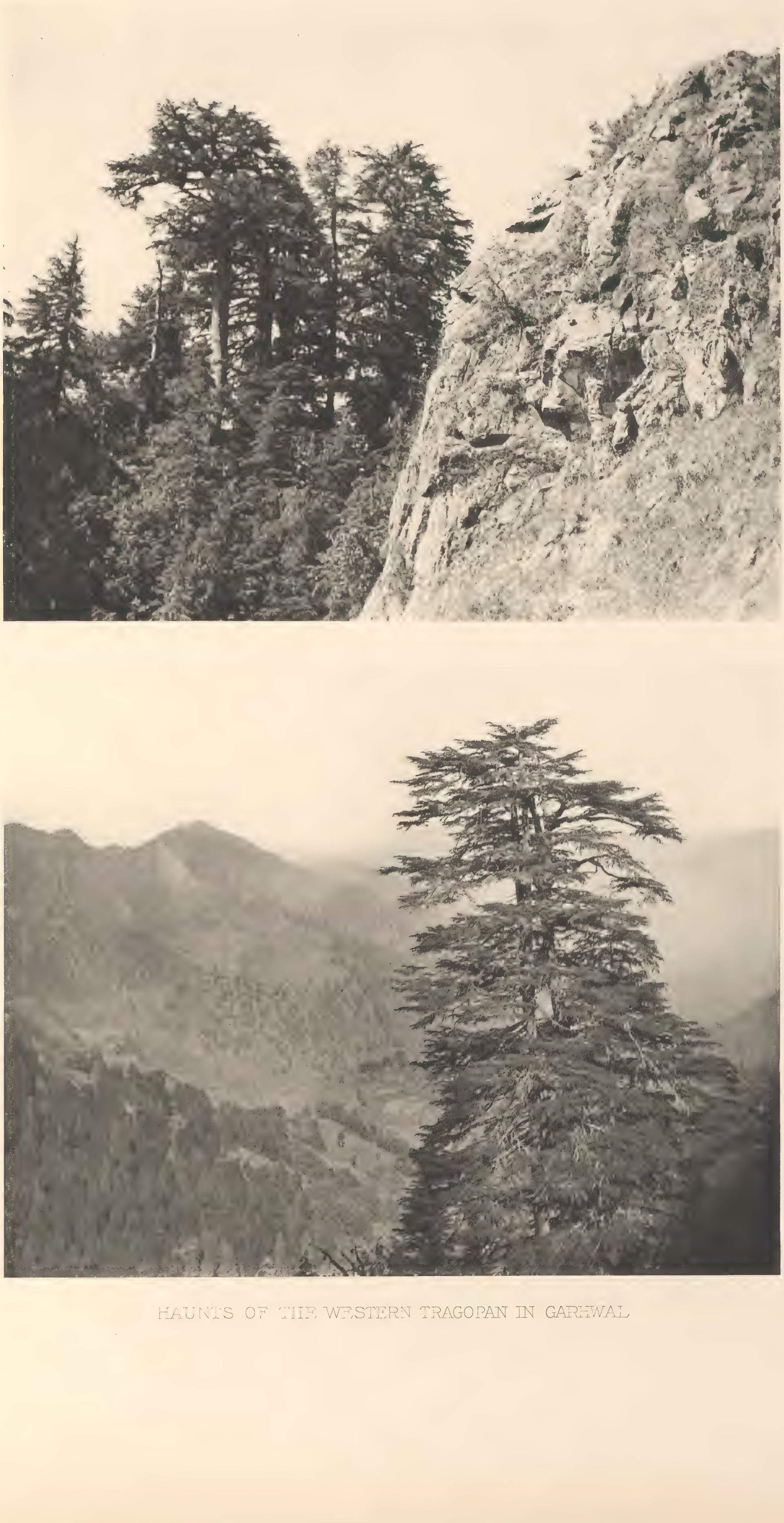
Passing over many unimportant but interesting bits of forest life which I observed on this memorable day, I at last caught a low, pheasant-like chuckle, which made every nerve tingle like an electric shock. It came from behind, and, as I had been thus outflanked more than once by pheasants, I peered out, but could see no sign of life. Then the chuckle again and a quiver of needles, and on the branch below the stick nest I saw a large bird. Even then, Tragopans were so far from my mind that I stared in unrecognizing bewilderment. Once more the low gurgling chuckle came, and the bird walked unsteadily to the trunk and leaped up to the nest itself. Then I realized that I was looking at a Western Tragopan hen, and a few days later I was to hear the self-same low chuckle given, as I have already related, as the vesper song of a cock bird.

The Tragopan, in her dull, mottled garb, was almost invisible as she stood motionless beside the nest in the shadow of the spruce foliage. Soon she began to

PHOTOGRAVURE 6

HAUNTS OF THE WESTERN TRAGOPAN

Steep mountain sides of rugged, outjutting rocks, where only turf and saxifrage can find roothold; more gentle slopes covered with sombre forests of deodars and silver firs; park-like vistas of emerald lawns starred with hosts of strawberry blossoms; such is the home of the Western Tragopan. In the warm sunshine the chicks spread wide their plumage, and lying on their sides lazily kick the dust over their little feathers. With the cool onrush of cloud shadow they shake themselves and hastily preen their disarranged plumage. When the storm from the Tibetan upland breaks, the little Tragopans scuttle for shelter beneath the ample wings of the gentle grey mother.



HAUNTS OF THE WESTERN TRAGOPAN IN GARHWAL

crane her head and neck about, and, bending low down, busied herself in some way invisible from where I watched. At last she jumped down to the branch below, then to the next, and so on, making a complete circuit of the trunk as she descended, and finally, when out of my sight, flew with but a low rustle of wings to the ground. For forty minutes I saw or heard nothing more, and then the crackle of a twig set me on the *qui vive*, and I soon saw her near the nest. A rough spruce twig had caught in her breast plumage and snapped off, tweaking out a feather or two, as I discovered when later I climbed the tree. Again she wrought silently at the nest, and again descended her resinous stairway. Once more she returned, this time with a beakful of leaves, which I could distinctly see, as they were so unlike the needles through which she ascended. She soon went away as before, and I never saw her again, although I waited until late afternoon, when my abused body would allow no further insult, and for very agony I had to leave my shelter and roll about upon the turf outside. Once, having thrown caution to the winds, I climbed the tree with some difficulty, for the needle-armoured, stiff-twigged maze made anything but pleasant going. Knowing that the wary bird would easily detect my clumsy trail of sap-bleeding footprints, I tied together the entire nest, brought it down, and made a careful analysis of the structure. A glance showed that it was not the work of the pheasant, but an old nest of some other bird; this disappointing fact being only too evident from the weather-worn character of the well-woven substructure of sticks and bleached grass. The lining was as obviously of very recent date; indeed, the green leaves of oak and some unknown weeds were still almost fresh and unwilted, while the twigs—a dozen or more with a strong aromatic scent, were still sappy at the ends, for all had been freshly broken off, and none were dead or dried. All had been plucked within forty-eight hours, as I satisfied myself by actual comparison with leaves and twigs which I gathered one day and examined on the following. This was the work of the Tragopan which I had been watching, although she could not have brought all the twigs and leaves on the three trips when under my observation. She must have begun work on the previous day.

I now turned my attention to the nest proper. I found that the twigs and grass were not nearly so bleached as the old dried stems about me on the ground, and traces of green near the nodes of the grasses seemed to make certain that it was this year's nest. Two small fragments of shell, which had sifted down into the matted lining, might have been parts of the egg of a raven or crow, or of many another species; it was impossible to make certain. The general character of the nest was corvine—no more could be said.

One's thought goes back instantly to Captain Lantour's nest—a true *nest*, but on the ground, and on the slender basis of these two nests we may theorize as to whether Tragopans are acquiring or losing the trait of arboreal nidification. Notes on other species in captivity show that the birds are pronouncedly arboreal, and will either refuse altogether to lay, or will lay irregularly, or often an unusual number, unless they can deposit their eggs in some elevated box or nest.

One can readily see how many terrestrial dangers would be avoided by birds of this size nesting in trees; but, on the other hand, if they are in the habit of utilizing the large stick nests built and already used by other birds, they are running considerably more risk than if they built a nest themselves. The nest of which I have written was remarkably well concealed. If I had not been close to the ground, and slightly down along the slope, I should never have discovered it. It was invisible when at last I stood up and looked toward it. But most used nests are much more in view. Constant approach of the parent birds breaks or wears away the adjacent leaves and twigs, and by the time the brood of the rightful owners is ready to leave, the nest is far from well concealed. Again, one hardly knows what nests could serve. In this instance the nest was doubtfully corvine, but such fearless, pugnacious birds usually build in plain view, a site which would give a hen Tragopan but short shrift. The greatest danger attendant on arboreal nesting would be the Himalayan langur monkeys, and the betrayal to eagles by inquisitive crows and jays. That the monkeys are at times a very real danger to pheasant nests I shall show in the case of the impeyan.

Be this as it may, it is certain that the Western Tragopan occasionally does utilize the tree nest of some other species of bird; and, after all, it is quite idle for a mere ornithologist to argue pro and con anent the advisability of tree or ground nesting! The keen eyes of my hen Tragopan had ferreted out an ideal nesting spot, and had it not been that her secret was one of the reasons for my having travelled so many thousand miles to her home, I should assuredly have left her undisturbed, with the full knowledge that her age-old instincts were far better guides for her safety and that of her brood than any logic of man—however carefully formulated—could ever be.

DETAILED DESCRIPTION

ADULT MALE.—Lores, forehead and entire crown glossy black, the feathers of the occiput changing suddenly to Indian red and forming a long, backward pointing crest. Ear-coverts and a narrow band entirely surrounding the gular lappet black. Nape, hind and side neck deep Indian red. Face, chin and throat lappet almost bare of feathers.

On the lower neck the red ends abruptly, giving place to an entirely different pattern and colouring, characteristic of the whole upper plumage. The mantle, wing-coverts, back and rump are uniform, having a background of pale greyish buff, thickly mottled and irregularly barred with black, while at the tip of each feather is a good-sized, round, black area, with a very sharply outlined spot of pure white in the centre. The only exception is a V-shaped patch of deep Indian red just below the bend of the wing, one arm of which extends obliquely across the wing, and the other along the anterior border.

Only on the scapulars, longer wing-coverts and tertiaries is there distinct evidence of the lateral olive ocelli, which form so prominent a character of *satyra*. These ocelli are often strongly tinged with ochraceous. The secondaries are dull brownish-black, barred with pale greyish-buff, which assumes a warmer buffy tone on the primaries. On the upper tail-coverts, the white ocellus expands to many times its usual size, and is bordered by a wide shaded area of rusty or rufous. The tail-feathers are black at the tips, mottled and banded basally with greyish-buff.

On the anterior lower throat and upper breast is a most remarkable patch of pale, glistening, orange-yellow feathers, deepest at the tips and paling to a lemon-white. The feathers composing this patch are extremely specialized, harsh to the touch, and stiff and disintegrated in appearance. The basal, downy portion of the feathers is normal, but distally the barbs become thickened, stiff and spine-like, with no trace of barbules. At the posterior edge of this area, the transition into the ocellated, normal ventral plumage is very gradual, the first hint of the latter being a tiny spot of black pigment with a speck of a white ocellus at the tip of the yellow, spiny barbs. The remainder of the ventral surface has almost all the visible portion of the feathers dull black, with a good-sized, subterminal round white spot. Just basal to the black area is a large zone of Indian red, usually broken at the shaft, but reaching to the margin on both sides. Even when the feathers are in perfect position, a portion of this colour protrudes, and thus the whole of the under parts shows an irregular scattering of red, varying in amount in every region. This ventral colouring extends anteriorly to the side neck between the orange breast and greyish dorsal plumage. The red is wholly absent from the belly, flanks and under tail-coverts, the white spot increasing in area and becoming more diffuse as we proceed posteriorly.

The weight of an adult male varies from 3 lb. 10 oz. to 4 lb. 8 oz. Mandibles black, pale toward the tip; irides hazel; facial area bright red; fleshy horns pale blue; gular lappet purplish blue down the centre, with the margin and deep lateral indentations salmon pink; feet and legs deep pink in the breeding season, pale fleshy at other times of the year. Spurs short and stout. Length, 684–735 (709); expanse, 937; bill from nostril, 15; wing, 285; tail, 275; tarsus, 76; middle toe and claw, 27 mm.

The feathering of the gular lappet of an adult male is of considerable interest. Stretching the lappet to a length of about 100 mm. we see that the upper surface has a very sparse sprinkling of feathers. Those on the anterior half, nearest the chin, are very degenerate, showing only the bare rhachis together with an equally bare after-shaft about one-third as long. Posteriorly we find a sprinkling of adventitious feathers with several terminal barbs. The highest development of the featherlets of this surface of the lappet occurs along the margins. Here several long barbs spring from the basal quarter of the shaft, each quite densely clothed with barbules. All these featherlets originate in the central dark zone, the wide, irregular marginal area being wholly bare.

On the under surface of the lappet we find a very different condition. Here are well-developed feathers scattered over the whole surface, about 10 or 12 mm. apart. An interesting fact is that the feathers which sprout from the dark zone are black, while those arising from the pink marginal area are red. The terminal (normally exposed) area of these feathers is well developed, but the downy basal portion which, in the body plumage, is long, fluffy and concealed, is here very short, in many cases a mere ragged fringe of barbs along the rhachis.

Adult Female.—Forehead plain sooty brown; crown dark with white shaft-streaks. Nape and hind neck with a decided tinge of warm orange buff, mottled with black. The mantle and entire upper parts are a grizzled and mottled grey. Most of the feathers show narrow whitish shaft-stripes, and lateral subterminal black ocelli. These are round and most perfect on the mantle and back, while on the coverts and inner secondaries they are reduced to conspicuous black marginal patches. The flights show the usual pale buff bar-mottlings on the outer webs. The rectrices show little trace of barring, the central pair of feathers being evenly vermiculated grey and black, the outer ones successively with more and more clear black, the grey being confined to the base. All have a pale ashy terminal band of mottling.

The feathers of the face, chin and throat are white, broadly margined all round with black. The upper breast shows a faint rufous tinge, but the under parts as a whole are a grizzled grey, a cold ashy hue, with no black patches or ocelli, and hence much paler grey than the upper parts. Each feather shows an elongated, subterminal, paddle-shaped shaft-streak of white, bordered, especially toward the extremity, with black. These increase gradually in size from the breast to the flanks. Iris dark hazel; legs and feet greyish. The measurements are: length, 608; expanse, 810; bill from nostril, 13; wing, 240; tail, 193; tarsus, 63; middle toe and claw, 63 mm.

First Year Plumage, Male.—The body plumage of this age is much like that of the female, but the head and neck present the greatest variability, the crown usually being blackish, while a collar of dark maroon completely encircles the neck. Many authors speak of these birds as gradually acquiring the adult plumage, but this apparent slowness of moult is wholly superficial and optical, based on colour alone, and due to a greater or lesser delay in individual moult. In wild shot birds I have found that the second autumn moult brings the complete adult plumage in all its perfection and brilliance. In captivity a bird of the third year will often still show signs of immaturity due to abnormal growth or imperfect nutrition.

In a wild bird shot in April there is absolutely no sign of moult, but a large patch of half-grown feathers on the left breast are fully adult. The preceding grey and white-shafted ones have been accidentally pulled out in some way, and even thus early in the year the adult pigment is waiting to be poured forth into the plumage whenever an opportunity offers.

The great variability of this plumage makes any single description difficult. The forehead and crown is dark brown or blackish, with occasionally narrow white shaft-streaks. The dark colour of the feathers of the rear crown and nape is broken by numerous crossbars of pale buff, which change on the neck to dark orange-red, while the black becomes a faint mottling or a narrow terminal fringe. This is continued around the throat as a band or collar enclosing the dull brown, buff-shafted feathers of the chin and throat.

The upper plumage is a rather uniform vermiculation of black and cold grey, the coverts and flights showing a warmer, more buffy tone. Invariably on the upper mantle, and occasionally scattered sparsely on the back and wing-coverts are small white ocelli, a single, subterminal one on each feather set in a small black area. Both primaries and secondaries are dark brown, with about six or eight irregular crossbar mottlings of pale whitish buff on the outer web.

The rectrices show about a dozen shaded, very irregular crossbars of grey, dark brown and whitish buff. The central pair resembles the secondaries in hue, while the others are clearer dark brown or black, with the crossbars white and fewer in number. All the markings are exceedingly irregular and variable in different individuals.

Beneath, the entire ground colour is like the mantle, an even vermiculation of black or dark brown on cold grey, but each feather shows an elongated white shaft-streak ending in a subterminal bubble or drop—a separate round ocellus framed in black. The general effect is most remarkable, as if scores of drops of white paint were flowing down the breast, coursing in concentric, regular lines, but each droplet separate, and leaving a tiny trail behind it. On the flanks these become much larger, irregular, and there is no shaft-streak. Birds of this age show the following average of measurements: bill from nostril, 14; wing, 266; tail, 205; tarsus, 74; middle toe and claw, 74 mm.

EARLY HISTORY AND SYNONYMY

This bird, under the name of *Phasianus melanocephalus*, or the Black-headed Pheasant, was described in 1829 by Gray, in Edward Griffith's edition of Cuvier, from a specimen said to have come from Almorah. A year or two later the bird was figured in Illustrations of Indian Zoology as a rather weird creature with two horns curving high above the head like those of a serow, yellow eyes and lappets. Another plate, representing a young male, was supposed to be the female.

Except that M. Vigors, in the very first volume of the London Zoological Society's "Proceedings," re-described the bird as *Tragopan Hastingsi*, this species has not been troubled with useless specific synonymy.

SYNONYMY—*Tragopan melanocephalus*

Phasianus melanocephalus Gray, in Griff. ed. Cuvier, III. 1829, p. 29.

Satyra melanocephala J. E. Gray, Ill. Indian Zool., I. 1830–32, pls. 46, 48; G. R. Gray, List of Birds, Pt. III. Gall., 1844, p. 28.

Tragopan hastingsi Vigors, Proc. Zool. Soc., 1830, p. 8; Gould, Cent. Birds Himal., 1832, pls. 63, 64, 65 [text]; Jardine, Nat. Lib., Orn., IV. 1834, p. 224, pls. XXV, XXVI; Hutton, Jour. Asiatic Soc. Bengal, XVII. Pt. 2, 1848, p. 695; Schinz, Nat. Vög., 1853, p. 147, pl. 70; Fitz, Atl. Nat. Vög., 1864, fig. 232.

Ceriornis melanocephala Gray, Genera Birds, III. 1845, p. 499; id. Cat. Hodgs., ed. I. 1846, p. 125; Blyth, Cat. Mus. As. Soc., 1849, p. 240; Gould, Birds Asia, VII. 1855, pl. 45; Adams, Proc. Zool. Soc., 1858, p. 498; id. Proc. Zool. Soc., 1859, p. 185; Jerdon, B. Ind., III. 1863, p. 517; Sclater, List of Phas., 1863, p. 10, pl. 10; Gray, List Gallinae Brit. Mus., 1867, p. 41; v. Pelzeln, Ibis, 1868, p. 320; Beavan, Ibis, 1868, p. 380; Sclater, Proc. Zool. Soc., 1870, p. 164; Gray, Hand-list Birds, II. 1870, p. 262; Elliot, Mon. Phas., I. 1872, pl. 23; Hume, N. and E. Ind. Birds, 1873, p. 522; Brooks, Stray Feathers, III. 1875, p. 256; Marshall, B. Nest. Ind., 1877, p. 59; Hume & Marshall, Game B. Ind., I. 1878, p. 144, pl.; Marshall, Ibis, 1884, p. 422; Oates, ed. Hume's Nests and Eggs, III. 1890, p. 410.

Cereornis melanocephala Ornithognomon, The Field, XXVII. 1866, p. 295.

Tragopan melanocephalus Ogilvie-Grant, Cat. Birds Brit. Mus., XXII. 1893, p. 273; Blanford, Fauna Brit. Ind. Birds, IV. 1898, p. 100; Oates, Game-birds India, I. 1898, p. 245; Nehrkorn, Katalog der Eiersammlung, 1899, p. 192; Sharpe, Hand-list Birds, I. 1899, p. 33; Oates, Cat. Eggs Brit. Mus., I. 1901, p. 51; Ghigi, Mem. R. Acc. Sci. Inst. Bologna, (5), X. 1903, p. 404, tav. II; Ward, Jour. Bombay Nat. His. Soc., XVII. 1906, p. 944.

Tragopan melanocephalum Ogilvie-Grant, Hand-book Game-birds, I. 1895, p. 224.

BLYTH'S TRAGOPAN

Tragopan blythi blythi (Jerdon)

A single male Tragopan, captured forty miles north of Assam, has recently been described as a subspecies of *blythi*.

NAMES.—Specific: *blythi*, named for Edward Blyth, an English naturalist, for many years curator of the Calcutta Museum. English: Blyth's Horned Pheasant, Grey-bellied Tragopan. French: Tragopan de Blyth. German: Blasses Satyrhuhn. Vernacular: Húrr-húrrea (Assamese); Sunsuria (Golden-bird, Bengali); Gnu (Angami Nága); Chingtho (Kuki).

BRIEF DESCRIPTION.—Male: Neck and chest, most of the head and bend of wing orange-red; upper parts sides and flanks black mottled with buff and each feather with a subterminal white spot flanked by two large dark-red patches; flights and tail mottled, without white spots; breast and belly smoky grey. Female: Above, dark grizzled olive brown, each feather with two lateral black ocelli; chin and throat white; below much paler than the upper surface, a central white ocellus on the feathers of the mid-belly.

TYPE.—Described from a captive male bird in "Sadiya, Upper Assam," by Jerdon, Proc. Asiatic Soc. Bengal, 1870, p. 60. Now in the collection of the British Museum.

RANGE.—North-eastern Assam.

BLYTH'S TRAGOPAN IN ITS HAUNTS

THIS was the only species of the five splendid birds of this group which I was unable to observe in a wild state. The eastern Himalayas proper and the Burmese-Yunnanese region contain so many interesting types of Phasianidae that I neglected to visit Assam, thereby missing the chance of studying the one species which is confined to that region.

One of the best field ornithologists of India, Mr. E. C. Stuart Baker, has, however, had the good fortune to meet with this bird several times, and it is through his courtesy that I am able to present this picture of the wild bird.

"Although common in parts of the Naga Hill Ranges at elevations over six thousand feet, Blyth's Tragopan is but a rare straggler into the adjoining ranges of North Cachar, and it was, therefore, some years after I was posted in that district before I came across it in a wild state.

"When at last I did see it, the meeting was most unexpected, for at that time I had no idea that this magnificent pheasant ever wandered so low as six thousand feet, the elevation at which I was then camping.

"The country surrounding my camp was of a very rugged and broken character; the main range of Hills, known as the Barail Range, running almost due north-east and north-west, and having on either side two rapidly flowing Hill streams—to the west the Jennam, and to the east the Jiri. These streams, though full of Mahseer, and magnificent from an Isaac Waltonian point of view, were too small except in their lower reaches, during the cold season, even for the use of dugouts. In the rains, on the other

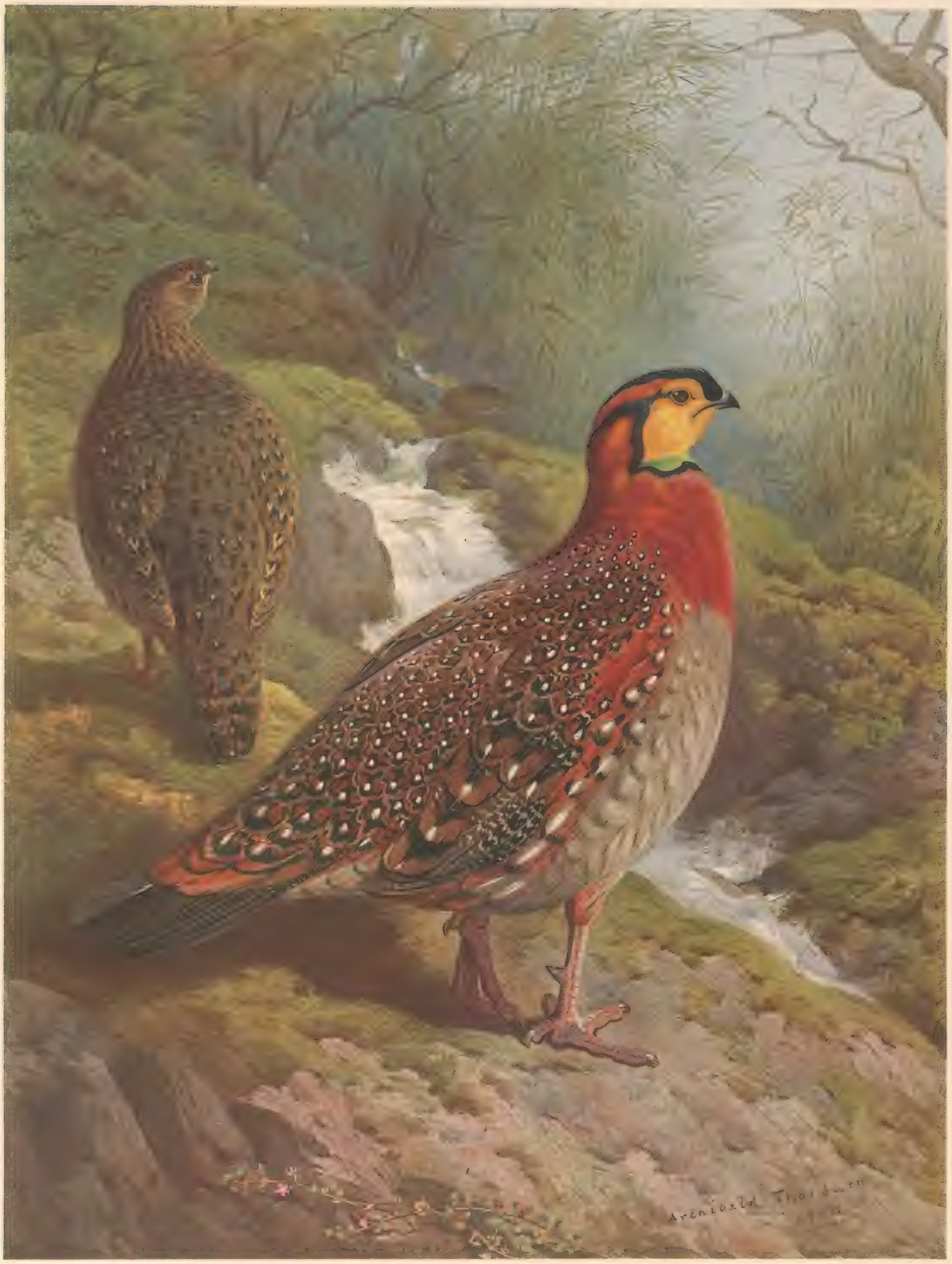
PLATE XI

BLYTH'S TRAGOPAN

Tragopan blythi blythi (Jerdon)

The deep, hot valleys of Assam and the hundreds of miles of lowland plains are populated by many birds, but never a Tragopan is found there. A mapped diagram of the haunts of this bird would appear like a cobweb tracing of all the crests and upper slopes of the higher mountains. Here the oak forests are moss-hung and scented with orchids and jasmine. The ice-cold rivulets are beloved of these birds, and they come out from the bamboo to the mossy boulders to quench their thirst and to send forth their musical clanging cry—a challenge to battle or a summons to a mate, as the case may be.

PLATE XI


Archibald Thorburn

BLYTH'S TRAGOPAN.

hand, they formed mad torrents of muddy water, hurling themselves from rock to rock in a blinding spray of yellow foam; or pouring themselves in a headlong tumult over broken rapids or actual waterfalls. Far above these streams—which in the distance looked like silver ribbons, towered the crests of Mahadeo, Hengmai, Hungrum, and other mountain peaks, narrow spurs jutting from their sides and running down into the valley beneath. At the feet of these mountains the vegetation was most luxurious and massive; magnificent forest trees reared their heads a hundred feet above the scrub and jungle which grew below them, but, as one ascended above four thousand feet the vegetation began to be more scanty, and from five thousand upward, stunted oaks, seldom more than thirty feet high, formed the principal part of the forest. Even here, however, the jungle was most lovely, for every tree trunk and every swaying bough was wreathed with masses of moss, amongst which nestled orchids of all colours and kinds. That beautiful scented orchid, the white snowdrop-like *Celogyne*, filled the air with its odour, and on every side the *Dendrobia chrysotoxicum* and *densiflorum* showed their masses of yellow blossom against the vivid green moss. Nor was the undergrowth unworthy of the rest of the forest. Here and there jasmine flowered and clambered in wild profusion; here and there were banks of bracken, looking as if imported from some Welsh mountain side, and everywhere were glades of various bigonias, with their multi-coloured foliage and flowers, and ferns of all kinds, from the most delicate trailing maidenhair to palm ferns as tall as the oaks around them.

"High up near the crests of one of these mountains ran a tiny rill, tinkling and trickling amongst the pebbles of soil laid bare during heavy rains, until with many others of its merry brethren it lost its identity in the rivers below.

"At the edge of this little streamlet I lay down amongst the moss and ferns prepared to watch whatsoever animal life might decide to show itself.

"Birds of all kinds were numerous and bold, taking little notice of the dull-clad human. A bevy of yellow-throated minivets flew from tree to tree; the orange and grey males constantly uttering their musical notes, as they flitted along in their follow-my-leader style from one fine field of insect game to another. A pair of scaly-breasted wrens bustled about over a fallen log, rather shy at first and resenting my presence with shrill cries, but soon becoming reconciled, and once more busy collecting material for their nest, hanging amongst the moss on a tree near by. Then a flash of transparent pink, yellow and grey, gliding from one tree-trunk to another, told me of the flight of one of the tiny flying lizards and almost urged me to rise and catch it—if I could—but laziness triumphed and I remained on my mossy bed. I had lain there about an hour and was almost dozing, lulled by the soft breeze and the hum of cicadas and grass-hoppers, when a chuckling call and a scratching amongst the undergrowth across the stream recalled me to my senses. At first I credited this call to a Horsfield's kaleege pheasant, though these are rare at this elevation, but presently a richly coloured brown bird made its way into the open space. This bird, I saw at a glance, was no hen kaleege, for even at the distance it then was I could see, without using my glasses, that the feathers were marked with broad striae or bands of colour darker than the rest. I had, however, never seen a hen Tragopan, and could not recognize what it was until she was followed by her mate, and a magnificent male specimen of Blyth's Tragopan, resplendent in his crimson glory, burst upon my view.

"For a few minutes the two birds, male and female, scratched about the hill just like a pair of barndoor fowls, now and then picking up an insect disturbed from under the pebbles, or seizing a grasshopper from the scraps of herbage scattered about over the bare ground. But presently, ceasing to take any interest in the abundant food all about him, the cock bird began to attempt to attract the attention of the hen by all sorts of antics and displays. At first he merely came up to her and bowed and scraped with his wings slightly raised, and his purple-blue horns fully dilated and projecting forward. Then, seeing that she took no notice, he depressed his wings and walked slowly around her, nodding violently as he walked and swelling out his throat and breast, the feathers of which were ruffled and standing almost on end. After a short time of this ineffectual display he once more stopped in front of the hen, and standing still, leaned forward until his breast almost, or quite, rested on the ground; he then extended both his wings, so that their upper portions faced the same way as his head, and stood thus for some seconds—a blaze of deep crimson, with his weirdly shaped horns quivering with excitement, and his wattles displayed to the fullest possible extent. Then suddenly his feathers collapsed, his horns nearly disappeared; he held himself erect, and once more quietly commenced to scratch and feed until he and his mate shortly disappeared into the adjoining forest.

"As far as I could see, the hen bird took little or no interest in the display of the male, and continued serenely feeding all the time it was going on, but this was perhaps only a ladylike way of inducing him to exert himself to the uttermost. Both birds constantly uttered a soft, chuckling note, and now and then the cock bird gave a rather loud *quawk*.

"I have had a great many of these birds in confinement and found them—once they had settled down—very easy to keep. They were almost omnivorous in their diet, and would eat any sort of grain; many kinds of green food, and any insects or small reptiles, etc., which I could procure for them. The males were rather quarrelsome, more especially during the breeding season, but they seldom did one another much harm, the weaker bird promptly apologizing and retiring to a distant part of the aviary, whilst the stronger was quite content to strut around, and proclaim in loud *quawks* what he would have done had it ever come to a fight.

"The cocks had a magnificent loud clanging—almost trumpet-like call, which they uttered only at daybreak during the breeding season; it was rather like a mild and musical call of a peafowl, but shorter and not nearly so harsh.

"Blyth's, like all other Tragopans, is essentially an arboreal bird, roosting, resting, and building its nest on trees. My birds laid eggs in captivity, but would never lay them in nests or sit upon those they had laid. The first eggs laid were broken because I did not know of the nest-building proclivities of the birds. The hen insisted on trying to lay them on a tiny shelf in the corner of the aviary, and, of course, they fell off and were demolished. After two eggs had been broken in this way I took away the shelf and fixed up a comfortable box filled with straw, but, refusing the box as a nest, she laid two more eggs upon the ground.

"I have never seen a nest of this bird, but the Nagas inform me that they are always built by the Tragopans themselves of good-sized sticks, with a rough lining of smaller twigs and sometimes grass and weed stems. Also, the Nagas assert, they are always placed in trees, stumps or small bushes, and never on the ground, and that as a rule, they are not more than six or seven feet from the ground and never more than twenty feet. The favourite place is said to be amongst masses of creepers growing over some dead tree, where the hen can sit hidden from the gaze of enemies of all kinds, but sometimes the nest may be found in the fork of a leafless sapling, its great bulk visible at a distance all round. My informants say that it lays two to five eggs, generally three or four, and this agrees with what I have observed in my captive birds.

"The male does not attain its full plumage for at least two years; for a year it closely resembles the female, but at its first moult acquires a certain amount of the adult male plumage, sometimes more, sometimes less, but never the complete dress. This may be attained at the second moult, but more often its full splendour is not put on until the third moult.

"The Nagas—especially the Angamis—are adepts at catching these Tragopans in nooses, and on one occasion I had no less than thirty of these beautiful birds brought in to me. A few were seen by the members of the Mishmi Expedition of 1900, but none were procured. Colonel Chatterton of the 6th Goorkhas told me that the wild birds were comparatively tame, and would feed and scratch about quite close to him, but they were such skulkers when on the ground, and so clever at hiding, that though close enough, it was very difficult to get a sight or shot at the birds."

GENERAL DISTRIBUTION

Blyth's Tragopan inhabits north-eastern Assam, its range on the whole being rather restricted, about the same in extent as *Tragopan melanocephalus*. We shall be allotting to it a generous distributional estimate if we outline it as thus: northern boundary, the Brahmapootra River; southern, N. Lat. 23°; E. Long. 96°, together with the Chinwin River; western, E. Long. 92°. It will be probably found that the bird extends slightly further to the north-east, perhaps over another degree of longitude, to 97° E. It extends through Manipur into the Lushai Hills and the mountains of northern Burma, and along the Brahmapootra, at least as far as Debrughur.

We may complete its area of life upon the earth by the third plane of space—the species lives from one mile to about one and three-quarter miles above the sea. This altitudinal distribution is somewhat more limited than that of the other species of Tragopan, owing in part to the character of its environment. About nine thousand feet is the highest to which any of the Naga hills attain, and Blyth's Tragopan reaches at times the very summits. It has been recorded from just above five thousand feet, which is probably an abnormally low altitude for the bird.

HABITS IN GENERAL

Less has been recorded of this bird than almost any other species of Tragopan, and the few facts which we have, all show that it differs in no radical way from its congeners.

During the cold or dry season it descends to somewhat lower altitudes, influenced not so much by climatic or temperature changes as by the drying up of the springs high up in the mountains. Like all the Tragopans, it is seldom found far from flowing water, and when the coming of the rains again fills the beds of the mountain streams, it ascends and nests near the upper limits of its life zone.

In the Chin Hills, near Fort White, it is said to be often seen, and to show so little fear of man that it has been knocked over by a stone, while feeding in the road.

Like the natives of Nepal, the Nagas catch these and other birds by means of a long line of snares, set across a ravine, into which the birds are driven slowly by a line of beaters. It is said that snares are also set in the paths which the birds are accustomed to take, which would show that, like the satyr tragopan, these also cover a more or less limited area in the daily ascent and descent in search of food.

It is said to nest about April, and to deposit three or four eggs, but no definite information concerning its nidification has yet been recorded by white men. Mr. Stuart Baker's observation of the courtship of the cock remains unique. The male possesses the typical tragopan fleshy horns and lappet brilliantly coloured and developed to their full extent only during the breeding season.

There should be ample opportunity of obtaining additional data concerning the life history of Blyth's Tragopan before it becomes extinct, owing to the dense, almost impenetrable nature of the forests it inhabits, especially during the rains when the birds are breeding. It seems little short of suicide to attempt to penetrate many parts of the Assam region during the terrific downpours of water at the rainy season. Immune to fever and such dangers though they must be, these birds, of all the Tragopans, would seem to have most use for arboreal nests—thus avoiding not only the terrestrial enemies of the dense forest, but the floods which in places are said fairly to inundate any level tract, and sweep clean much of the slopes.

As I have mentioned in the introduction to the synonymy, the second known specimen was brought alive to the London Zoo on March 12th, 1870. This bird lived six months. Since that time four other specimens have been placed on exhibition in the same institution. The average duration of the life in captivity of these five birds, four of which were males, was a little over three years, while one of them established a record for the entire genus with a duration of life of eleven years and one month. The average life is also considerably superior to that attained by any other species in captivity. This is doubtless directly attributable to the greater similarity which is presented by the English climate to the humid atmosphere of Assam, unlike that of the higher Himalayas and the ranges of central China.

Birds kept in captivity in Assam have thriven on a diet of berries, worms, and unhulled rice.

In the collection of the British Museum is the skin of an immature male, said to have been bred in captivity. An egg in that museum, labelled as from Sadiya, resembles the eggs of Temminck's tragopan, being of a rufous-buff colour, thickly speckled with dull rufous-brown. It measures 61 × 44 mm.

TEXT IDENTIFICATIONS

PAGE.	LINE.	
78	19	Mahseer, *Barbus tor.*
79	27	Yellow-throated Minivet, *Pericrocotus solaris* Blyth.
79	29	Scaly-breasted Wren, *Pnoepyga squamata* (Gould).
79	34	Flying Lizards, *Draco* sp.

DETAILED DESCRIPTIONS

Adult Male.—Lores, forehead, face, crown, ear-coverts, and a broad band around the throat lappet and the nape jet black. Face, chin and lappet almost bare. Entire mid-crown from above eye back over occiput deep orange red. The long black fore-crown feathers extend over the centre of this area, dividing it superficially into superciliary lines. The same orange-red colour is found around the entire neck, on the breast, and on the bend, and part of the anterior edge of the wing. Above, the red of the neck gives place abruptly to the dorsal pattern. This is rather complex as, unlike *temmincki*, the distal specialized area of the feathers is too slightly developed to conceal the basal, generalized buff and black portions. On the other hand, the pigmentation of the ends of the feathers shows a decided advance over that of *satyra*. Taking a feather from the lower mantle as typical, we find that the basal three-fourths of the integrated part of the vane is dark brownish-black, mottled and irregularly barred with pale buff. The terminal fourth is occupied chiefly by two large lateral ocelli of warm Indian red, which coalesce at their anterior inner portions across the tip of the shaft. In the centre of latter area is a round white ocellus of pigment, with its outline well marked, but diffusing a dim haze of pearly white over the terminal barbs between it and the tip of the feather. This diffusion becomes very marked on the longer wing and tail-coverts. As about half of the definite portion of each feather is visible, the dorsal pattern and colour are equally divided between the specialized and generalized areas. The flight feathers are black with conspicuous crossbars, pale buff on the secondaries, warm buff on the primaries. So extreme is the diffusion of the white ocellus on the longer tail-coverts, that almost the entire visible area is creamy white, with a margin of rufous. The tail feathers are black with considerable basal mottling.

The under surface, starting abruptly at the transverse margin of red on the breast, is smoky grey, with faint indications of the subterminal white ocellus, in the form of a diffuse whitish area. The flanks show a patch of feathers coloured as on the dorsal surface, with the white ocellus reduced to a narrow line, and much of the red ocelli obscured with smoky grey.

The flesh colours, as in all the Tragopans, vary considerably according to the season of the year. Orbital skin orange, cephalic horns azure blue, lappet yellowish orange, set off by intense bluish green. Mandibles dull horny, pale at tips; irides dark hazel; legs and feet brownish yellow, changing to a strong pink or even reddish in the breeding season; claws darker. Spurs short and stout; bill from nostril, 16; wing, 261; tail, 200; tarsus, 80; middle toe and claw, 76 mm.

Adult Female.—Of all the female Tragopans this species shows the highest development of the lateral black ocelli. On the forehead, crown and nape the feathers are black with little more than a greyish buffy tip. Posteriorly we find the buff pushing down the feather, outlining the two lateral, subterminal, black ocelli, and covering all the remainder with a mottling of grey-buff and dark brown. The ocelli are further emphasized by a narrow frame of warm rufous-buff. Here and there pale centres are developed, but they become nowhere a prominent feature except on the outer middle wing-coverts, where they are pale buff, and, to a less extent, as white spots on the longer, upper tail-coverts. The flight feathers are all banded on the outer web with warm buff, and the rectrices are crossed by warm, mottled bands of black, pale buff and rufous.

The breast is like the mantle, becoming paler posteriorly, but showing little or no development of central white until the mid-belly is reached, where it is clouded and rather ill defined, surrounded by a confused vermiculation of pale buff and brown. The white centre or ocellus is very strongly developed on the under tail-coverts, where, upon a dark background of mottled yellow buff and black, it stands out as a clear oval, subterminal ocellus of white. Iris brown; legs and feet brownish flesh. The measurements of an adult female are: bill from nostril, 16; wing, 233; tail, 172; tarsus, 71; middle toe and claw, 66 mm.

FIRST YEAR PLUMAGE, MALE.—The young males at their first autumn moult show as great variation as any of the other species of this genus, and it was a very typical individual in this mixed garb which, after an error in sexing, was described and figured as the female of this species. In addition to the head and neck, the longer upper tail-coverts seem almost invariably to acquire about half of the fully adult colour and pattern at this moult. I have never seen more than one or two clean, evenly coloured birds in first year plumage. In these rare individuals the resemblance to the female is considerably closer than in other tragopans. The crown, nape, mantle and breast, however, are banded with equal amounts of black and buff. The chin and throat are white. The upper parts show an evenly grizzled vermiculation of pale buff and black, with conspicuous lateral black ocelli, which, however, lack the buff frame in which they are set on the female's plumage. The rather cloudy, but large white centres or ocelli of the ventral plumage are bordered by dull brown, and framed in pale yellowish buff.

In the place of such a well-balanced plumage, however, we almost invariably find the head and neck well advanced, showing more or less clearly the black and crimson markings of the old birds. Although the crimson of the upper throat is almost always present in a state of more or less purity, the chin and throat usually retain their white feathering, and show little thinning on the gular lappet until the succeeding moult. Variously scattered over the back are the twin chestnut ocelli, while here and there the pearly spots appear on the breast. Birds of this age, compared with individual Temminck's tragopans equally immature, reveal strikingly how little real difference exists between the two. At first sight they appear totally unlike in hue and pattern, and yet merely the elimination of the crimson from the feather tips of *temmincki* results in the exact patterns and colours of *blythi.*

The flight feathers of these young cocks are more abundantly and irregularly mottled and barred with rufous than they will be after the coming moult into adult dress, and the tail feathers will lose their rather regular crossbarring of dark brown, rufous and buff, and become more uniformly black.

Not only in colour and in pattern do the feathers of this moult vary exceedingly, but in size. For example: of two young males, one, with a more rufous barred tail, showed the measurement of this organ to be 163; while in another the tail, which was less marked, and blacker in general tone, was 178 mm. long. Thus nicely balanced are all the slowly maturing characters which are gradually synthetically forming in the hidden stream of blood.

The iris is dark brown, legs dull reddish, gular skin showing through the skin dull orange; skin around the eyes livid. Measurements of first year males are: bill from nostril, 16; wing, 241; tail, 163 mm.

EARLY HISTORY AND SYNONYMY

The first specimen of this species of Tragopan of which we have any record was a male in captivity in Upper Assam. After the death of the bird, Dr. Jerdon obtained the skin, thinking it was a Temminck's tragopan, and late in 1869 wrote to that effect to the editor of "The Ibis." Dr. Jerdon soon realized, however, that the bird represented an entirely new species, and in the "Journal of the Asiatic Society," in 1870, he described and named it *Ceriornis blythi.* The discovery of this Tragopan was associated, as was the first specimen of Geoffroy's blood partridge, with a new species of monâl, the bird in this case being *Chalcophasis sclateri.*

A few months later, Dr. Jerdon obtained from Major Montagu a second live Blyth's Tragopan, which he sent to the London Zoo, where it lived for six months. But though these first two individuals were both captive birds, the species, in the succeeding forty-odd years, has been very rarely seen alive in aviary or zoological garden.

The male type specimen at present in the British Museum is a well-made skin, but the ventral plumage has faded from the normal cold grey to a decided brown. The end of the tail is much abraded.

SYNONYMY—*Tragopan blythi blythi*

Ceriornis temmincki Jerdon (nec Gray), Ibis, 1870, p. 117 [Upper Assam]; Newton, Ibis, 1870, p. 520.

Ceriornis blythi Jerdon, Proc. Asiatic Soc. Bengal, 1870, p. 60; Sclater, Proc. Zool. Soc., 1870, pp. 163, 219. pl. 15; id. Ibis, 1870, p. 520; Gray, Hand-list Birds, II. 1870, p. 262; Gould, Birds Asia, VII. 1872, pl. 47; Elliot, Mon. Phas. I. 1872, pl. 26; Godwin-Austin, Proc. Zool. Soc., 1872, p. 496 [Naga Hills]; Hume, Stray Feathers, VII. 1878, p. 472 [♀ described]; Hume & Marshall, Game Birds India, I. 1878, p. 152, pl.; Godwin-Austin, Ibis, 1878, p. 206 [Mozemah]; id. Proc. Zool. Soc., 1879, p. 457, pl. XXXIX; Sclater, Proc. Zool. Soc., 1884, p. 477; Hume, Stray Feathers, XI. 1888, p. 301 [N.E. Manipur].

Tragopan blythi Ogilvie-Grant, Cat. Birds Brit. Mus., XXII. 1893, p. 276; Ogilvie-Grant, Hand-book Game-birds, I. 1895, p. 228; Blanford, Fauna Brit. India, Birds, IV. 1898, p. 102; Oates, Game-birds India, I. 1898, p. 254; Baker, Jour. Bombay Nat. His. Soc., XII. 1899, p. 487 [North Cachar, des. female and juv. male]; Sharpe, Hand-list Birds, I. 1899, p. 33; Oates, Cat. Eggs Brit. Mus., I. 1901, p. 51, pl. V. fig. 5; Ghigi, Mem. R. Acc. Sci. Inst. Bologna, (5), X. 1903, p. 404 [Physiology of horns and lappet]; Ghigi, Arch. Zool., I. 1903, p. 297; Finn, Game-birds India and Asia, 1911, p. 30; Venning, Jour. Bombay Nat. His. Soc., XXI, 1912, p. 632; Beebe, Zoologica, I. No. 15, 1914, p. 270.

Trogopan blythi blythi Baker, Bull. Brit. Orn. Club, XXXV. 1914, p. 18.

TIBETAN TRAGOPAN

Tragopan blythi molesworthi Baker

A single male Tragopan was collected by Captain Molesworth during a recent expedition to the Mishmi Hills. It came from Dengan La, near Tawang, at eight thousand feet elevation, a state under Tibetan rule, but only forty miles north of the Assam border. In the "Bulletin of the British Ornithologists' Club," vol. xxxv. 1914, p. 18, Mr. Baker describes this specimen as follows—

Adult Male: Differs from *Tragopan blythi blythi* in having the whole upper parts much darker in general tint, the rufous spots much browner, and the buff vermiculations narrower and less distinct; the white spots are smaller though equally numerous. Below, the red of the breast is confined to a comparatively narrow gorget, descending only a short way below the neck on to the breast, and the whole of the rest of the lower parts are much paler than in *Tragopan blythi blythi*, the pale centres scarcely showing at all in contrast to the surrounding parts of the feather. Both legs show powerful but short blunt spurs about 10 mm. in length.

Total length about 530 mm.: bill, from front, 19; wing, 250; tail, 195; tarsus, 76; middle toe and claw, 76 mm.

Habitat: Tibet.

Type: Male in the Museum of the Bombay Natural History Society. Dengan La, 8000 feet, Tibet, March 30, 1914.

Capt. Molesworth, collector.

Observation: This bird has been named in honour of the collector, Captain Molesworth.

TEMMINCK'S TRAGOPAN

Tragopan temmincki (J. E. Gray)

NAMES.—Specific: *temmincki*, for Coenraad Jacob Temminck, the noted Dutch ornithologist. English: Temminck's Horned Pheasant, Chinese Crimson Tragopan. French: Tragopan de Temminck. German: Hornhuhn. Vernacular: Oua-oua-ky (Waa-fowl); Ko-ky, Kiao-ky (Horned Fowl); Sin-tsiou-ky (Starred Fowl); T'so-che (Chinese for longevity, referring to the lappet pattern, which resembles this character).

BRIEF DESCRIPTION.—Male: Forepart of head, band around neck and throat, black; long crest, nape and breast orange red; above and below dark Indian red, each feather on the upper parts with a black-rimmed, pearl-grey spot, which on the lower plumage is expanded into a large grey patch, with red edge. Female: Above mottled dark and buff, set off by light central areas and round black patches on most of the feathers; crown streaked; chin and throat buffy; feathers of lower parts with large, oval, white, central ocelli, set in a border of yellowish buff.

TYPE.—"China," J. E. Gray, Illustrations of Indian Zoology, I. 1830–32, plate L. Now in the collection of the British Museum.

RANGE.—Central China, including southern Shensi, western Hupeh, almost all of Szechuan, and northern Yunnan and Burma.

GENERAL DISTRIBUTION

TEMMINCK'S Tragopan is the most widely distributed of all its congeners. Although many scores of these birds have been exported alive from China, almost all have been snared by natives, and we have very few authentic records of exact localities. Père David gives as its range south-west China to, and including, central Shensi. Several explorers have obtained it in the vicinity of Tatienlu, Szechuan, and live birds were brought by Mr. Medhurst from the mountains north of Hankow. Other records extend its haunts eastward to the Mishmi and Abu Hills and close to Sadiya in extreme northern Assam. Swinging round northern Burma we find it on the Yunnan frontier as far south as Sadon, near which, in Burmese territory, three Tragopans have been shot. Though I searched this region carefully, in December 1910, I did not see a single Temminck's Tragopan until later, when I entered Yunnan. My southernmost record was a little south of 258 north latitude, about twenty miles north of the Bhamo-Tengyüeh trail, at an elevation of some seven thousand feet.

With these scattered records, together with a general knowledge of the altitudinal distribution of the bird, we may safely plot this Tragopan's wild home as lying within an elongated rectangle, extending north-east and south-west, the upper two corners respectively in south-central Shensi and central Hupeh, the lower corners at Sadiya in Assam, and Sadon, Burma. The lower long side will extend north-eastward across the north-west corner of Yunnan and across Szechuan, some distance north of the Yangtze River.

GENERAL ACCOUNT

To show the meagreness of our knowledge concerning the wild life of Temminck's Tragopan I shall quote every fact which I have been able to unearth in the literature of this species.

Père David tells us that nowhere is it a common bird. "It lives alone on wooded mountains, and rarely leaves the underbush, where it feeds on seeds, fruits and leaves. Its very loud cry is most easily rendered by the syllable *oua*, twice repeated; it is from this that it receives its name of *Oua-oua-ky*. It is a very fine game bird, the more so because it is rare and not easily captured by snares or wires."

"Call: a single high note, not unlike a cat's mew."—Scott.

"A ground species, hiding in the jungle under the pine trees. It is not known to occur under 10,000 feet above the sea."—Seebohm.

The late W. R. Tappey found the bird in the mountains of Szechuan between three and nine thousand feet elevation, in heavy hardwood forest with a dense undergrowth of scrub bamboo. In winter they feed on frozen fruits and berries. While feeding they often utter a low clucking sound. Wilson, writing of the same general region, gives the following notes: "This strikingly handsome bird is fairly common in parts of western Hupeh and western Szechuan between 4000 and 9000 feet altitude, frequenting woods and shrub-clad country. It prefers steep mountain-slopes, covered with arborescent vegetation, and in summer, when the foliage is on the trees, is most difficult to find. In winter it may occasionally be surprised, early in the morning and evening, near the margins of cultivation and close to thick cover. Like all the woodland pheasants these birds will only take wing when hard pressed and usually afford only a chance snapshot. A heavy bird, the Tragopan flies at almost the speed of an ordinary pheasant, and always makes straight for dense brush or timber. The Chinese entrap them alive in the same way as they do the Golden and Amherst Pheasants. They are esteemed highly as pets and they sell for 3 to 5 ounces of silver each—a high price in these regions. The markings on the wattle are supposed to resemble the Chinese character for longevity, hence the common name, 'T'so-che.' They are regarded as birds of good omen, bringing good-luck and long life to their fortunate owners. Every year numbers are brought down to Ichang for sale, where they find ready purchasers. In the mountains they apparently adapt themselves to captivity, but in the Yangtze Valley proper the climate is too hot for them.

"The short tail and heavy body make the birds appear heavy in flight, and shooting them would be moderately easy did one but get fair chances. The Tragopan is a good table bird, but to shoot them for this purpose alone would be gross vandalism. They feed on grain and berries, and are especially fond of the fruits of *Cotoneaster* and allied shrubs and of maize. South of Ichang this bird is much rarer than in the mountains north-west of this town and in western Szechuan."

Although I saw two, or possibly three, live cock Tragopans in Yunnan (see under General Distribution, page 87), I can add little of interest concerning them. Two of the birds I watched for a full minute at some distance, one perched upon a low, dead limb, the other preening its feathers close by on the ground. I tried to stalk them, but when I had crept carefully some distance up a narrow gully, only one was to be seen. The vegetation was sparse, and I could see for ten or fifteen yards in all directions, so the bird must have gone clear away during my approach. From my vantage point behind a boulder at the rim of the gully I watched the perching bird and saw it stand up full height and leisurely stretch each wing and leg, pushing the toes straight out through the extended outer primaries in the familiar gallinaceous manner. It gave two quick,

PLATE XII

TEMMINCK'S TRAGOPAN

Tragopan temmincki (J. E. Gray)

Although the most widely distributed, yet this is the least known of its group. Its home is in the great heart of China, far from the beaten trails which all travellers follow, and among the oaks and rhododendrons of high altitudes. This Tragopan spends much of its time among their gnarly branches, feeds on their buds and fashions its nest in the dense foliage. Few white men have seen it wild, but the Chinese frequently trap it. They have spread out the great curious throat wattle and have found a resemblance in its pattern to one of their written characters; so to them the Tragopan is *T'so-che*, the bird of longevity.

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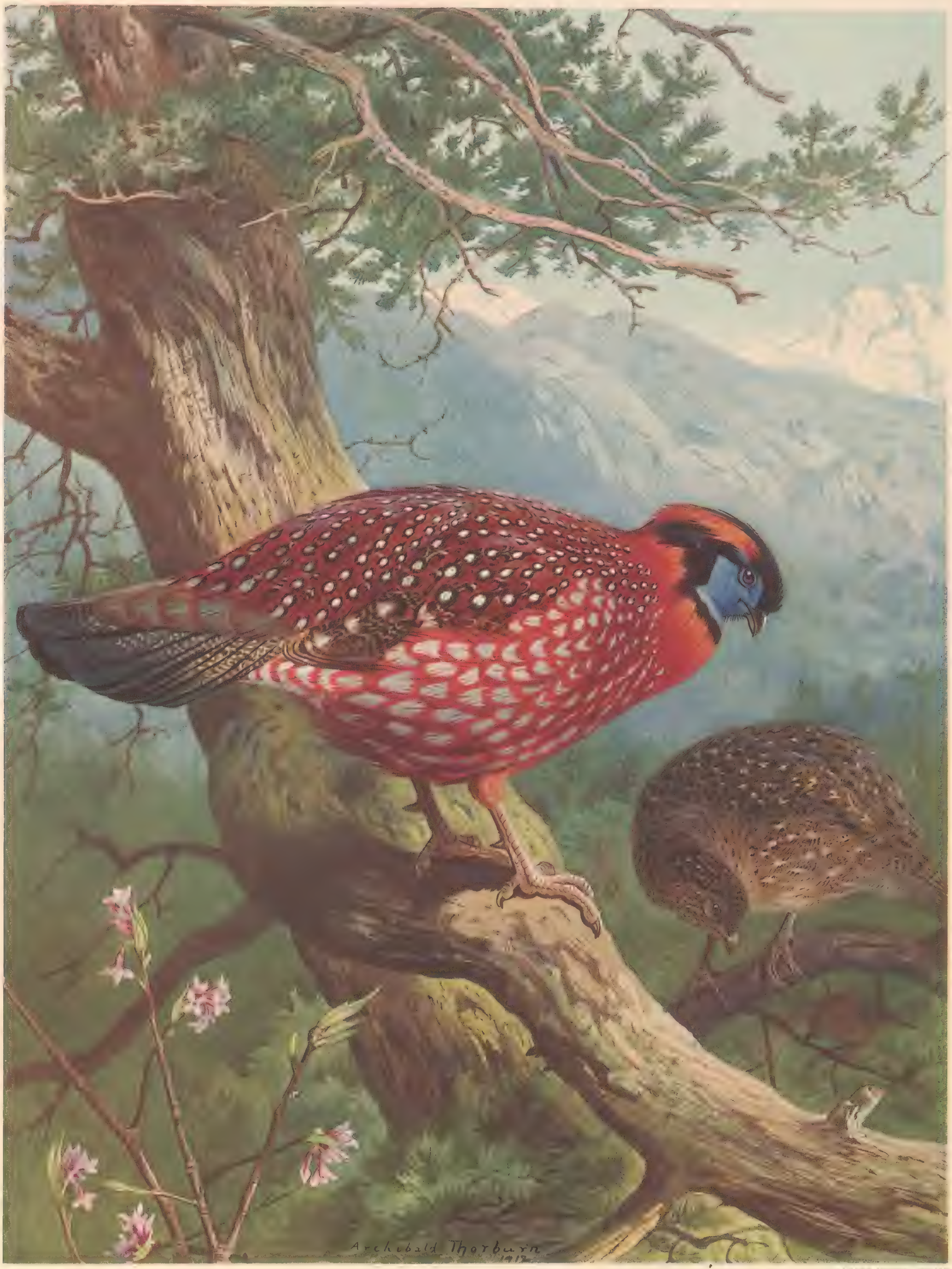
PLATE XII


Archibald Thorburn
1912

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TEMMINCK'S TRAGOPAN.

noiseless flaps, and, with a vigorous shake, ruffled up and then settled its plumage. At last the bird leaped to the ground, and after watching it peck among the dead leaves for a time, I shot it.

It was in full plumage and entirely through its moult. The horns and lappet were very inconspicuous, shrivelled up, indeed in the lowest condition of annual development. They were pale blue, the lappet varied with dusky reddish-brown. Mr. Scott's birds, shot at the end of March near the Sadon frontier, many miles to the north and east, had the horns of a light peacock blue, and the lappet of the same colour, mottled with reddish-yellow spots a quarter of an inch in diameter. There seems to be considerable variation in the ornamentation of the lappet, for I have seen a bird with a flesh-coloured wattle barred with nine transverse blue bars. In this specimen the fleshy horns were violet-blue, and the lores very pale blue.

The crop of the bird which I shot was filled with a comminuted mass of leaves, and an almost equally macerated number of insects. These were unrecognizable, except for two small spiders (*Bowis* sp. and *Araneus beebei* Petrunkevitch) which apparently had just been swallowed.

The country was most uninteresting at this place—steep mountain sides covered with stunted rhododendrons and bamboo stubble, while the constantly overcast skies and cold, bleak wind kept most birds and insects hidden. I could give but one more day to this locality, and caught only a glimpse of another Tragopan, or perhaps it was the same bird that I saw on the preceding day. The native Chinese and Kachins of this locality did not seem to recognize the bird and had no name for it, other than the general one for large bird. I have found that in all this country the knowledge of the people is a thoroughly reliable guide as to the general occurrence of any species of pheasant, for so thoroughly do the numerous lines of snares and traps carry out their intended purpose that few species of these birds fail to fall victims, at one time or another. I believe that in the winter time these Tragopans wander about much more than their Himalayan representatives, and that at this season they gradually work farther to the south than their normal summer breeding range.

On my former trip, although, as I say, I saw no Tragopans on the Burmese side of Sansi Gorge, yet on the Yunnan side, beyond Tabu-pum, I found, on December 8th, 1910, many feathers of this species in an old Kachin deadfall. From the abundance of these, both wing and tail as well as contour feathers, I judged that some wild animal, and not the Kachin, had benefited from the capture. The trap had not been reset, and if the human owner had found the bird he would have taken it away before plucking it.

CAPTIVITY

Our lamentable lack of knowledge of the habits of the bird in its Asiatic haunts is somewhat balanced by the fact that Temminck's Tragopan is perhaps the most well-known in captivity of all its genus. This is doubtless due to the love of pets which is so deeply implanted a trait in the Chinese, and which impels them successfully not only to trap, but also to rear wild birds and animals, and consequently to sell a certain number to foreigners. As I have elsewhere said, these people made use of the bird in decorative work many years before it became known to Europeans, and soon after Mr.

Reeves had sent skins to England he succeeded in obtaining living birds from the Chinese menagerie at Macao, near Hong-Kong. For France, M. Dabry was the first to obtain and successfully send living Tragopans of this species to Europe. The first one recorded at the London Zoological Gardens was in 1864, and since then Temminck's Tragopans have been more or less constant inmates of all the larger zoological gardens, and of many private ones, both in Europe and America. In London they have bred more than a dozen times, and altogether there is more than a score of records of their nesting in captivity.

Thirty-seven captive Temminck's Tragopans show an average life of about two-and-a-half years, with a single record of ten years and three months. One cock bird in Holland is said to have lived for fourteen years. This is a considerably stronger viability than is exhibited by the Himalayan forms, and Temminck's Tragopan, being distributed over a greater extent of country, and subject to more extreme changes of climate in its wild state than the others, may be slightly more adaptive.

In 1869 the first Temminck's Tragopans were hatched and reared in England, although eleven were reared in Antwerp three years earlier. Owing to the successful breeding of the next few years, we read everywhere in the ornithological literature of that day of the great hopes entertained of its establishment as a game bird, along the lines of the ring-necked pheasant. But we can now look back at the efforts of the last two score years and realize that such an undertaking is impossible. Nothing could be more encouraging than the immediate acceptance of nesting facilities which these birds often exhibit; but from one ailment or another the birds, both old and young, drop off, until a new stock must be procured, and the last of the earlier birds will be found dead. Of four places in China where these birds were being kept in captivity—two being under ideal conditions—I found the result was identical: immediate success; ultimate failure to establish permanently the species. Some of our American aviculturists find difficulty in keeping Tragopans alive more than six or eight months. In the New York Zoological Park, however, we have living Temminck's Tragopans which have been in the collection for more than five years.

As this is the commonest species in captivity, so its mode of courtship is most familiar, and so closely does it approximate that of the other Tragopans, that it may confidently be considered as representative of all.

In this species, as in all the Tragopans, the males are distinguished from the females by a number of secondary sexual characters, not only a pair of spurs, a crest and an increased brilliancy of colour of the entire plumage, but also by three dermal cephalic appendages, a pair of fleshy horns and a median transverse throat lappet or wattle. I shall treat of these more particularly under the detailed description of this species.

We are all familiar with the fleshy appendages with which the cocks of pheasants and fowls are decorated, but in the case of the Tragopans the wattle and horns on the head are comparable more directly with the excrescences on the head of the turkey cock. For, while the comb and wattles of the domestic rooster remain much the same throughout the year, the Tragopan's ornaments not only gain in size and colour as the breeding season approaches, but actually swell and dilate at the moment of supreme display. Thus they play as active and direct a part in the courtship as the voluntary spreading of the golden pheasant's ruff or the peacock's train.

The two little horns, which ordinarily are concealed beneath the feathers of the head, are at the moment of display raised, elongated and slightly distended, appearing well above the head plumage. The wattle, which usually hangs limp and shrivelled, partly concealed within the concavity of the throat, at the supreme moment of courtship is distended with great rapidity, so that it forms a brilliant, particoloured apron or shield over the front of the bird. The Chinese are able to make a solitary cock bird display quite frequently by placing a mirror in front of the cage.

A few weeks before the breeding season, the cock Tragopan, with the brightening of its fleshy hues, begins to pay more attention to the hen. In the wild state we must remember that the male, in all probability, has spent the winter and early spring in solitary state, and only later, as we have shown in the case of the satyr tragopan, does he take up a conspicuous place and send out his challenge and love notes. In captivity, if confined at a distance from the hen, the two will call to each other at intervals during the day. When together in the same enclosure, I have never heard the female utter any unusual note at this season.

As the breeding season approaches, and the loud challenge cries have remained unanswered, the cock commences actual display. Various authors have divided the courtship actions into several categories, but those appear to have no value as indications of actually complete, separate performances, but rather represent gradual approaches, varying in intensity, to the final elaborate *ensemble*. The principal preliminary overtures may be described as follows—

1. A slow, stately walk about the female, the wing toward her lowered and partly spread, the shoulder on the farther side raised, the body being thus flattened, with much of the upper plumage in view.

2. A sudden rush with partly spread wings, with or without the erecting of the horns, or the wattle, or both.

3. In the *tout-ensemble* of the climax, the bird suddenly ceases its stately gait, the plumage of most of the lower parts is fluffed out; the half-spread, drooping wings move slowly, with wrist edges well out from the body and tips pressed inward and downward; the head and neck vibrating spasmodically until the horns and wattle flash out to their utmost. This last trick gives to the Tragopan an indescribable appearance: from beautiful it becomes gaudy; from an excited, half-crouching bird, it changes to a grotesque, painted creature, and before one knows whether to admire or merely marvel, the moment has passed, the horns and wattle contract, the feathers settle, and after a moment the Tragopan walks off, or it may at once begin to pick up food. Any movement on the part of the hen at once attracts its attention, and soon the stately walk and slanting display may be renewed.

The culmination of this extreme display is unquestionably more or less involuntary or impulsive—that is, the bird is suddenly wrought up to an ecstatic state comparable to the *spel* of the capercaillie.

A French pheasant fancier describes the courtship of this Tragopan as taking place morning and evening. The bird appears as if taken with convulsions, erecting the horns and the crest; while the blue and red lappet seems to shoot out from the throat, following the abrupt movements of the head. It swells up all over, erecting itself quickly, and appearing covered with a magnificent breastplate, reaching almost to the ground. Then the appendages are retracted by the same jerking movements of the head, only to be spread and displayed again a moment later.

I have seen a bird give its full performance eight times in an hour, and most of the remaining time keep up the slow walk. Several times the bird may start on its final display and be disturbed or for some reason stop midway. It may be merely a coincidence, but I have never seen the hens pay any attention to the most persevering suitor, except at the flash of the wattle, when they will almost always stop for a moment, whether feeding or drinking. Indeed, the flashing of such a heliograph of azure and scarlet could scarcely be ignored. Twice I have seen Tragopan cocks display to ordinary hens. Once the hen was feeding with her back turned, and of course was unaffected; the second time the surprised bird leaped up with a single squawk of alarm and craned its neck in all directions for several seconds after the Tragopan had walked away.

Although I have seen a cock Tragopan follow the female into cedar trees and from branch to branch until she leaped to the ground again, I have never seen any arboreal display. Ghigi has apparently been more fortunate, as he says: "*mentre gli altri fagiani si mantengono al suolo per fare la ruota, i Tragopan inseguono le loro femmine anche sugli alberi.*"

Captive birds begin to lay early in April, and this and the first part of the following month constitute their normal breeding season, June and July eggs being the unseasonable results of earlier failures, either from sterility or from having been disturbed while sitting. The question of the number of eggs is one of unusual interest. The single ground nest of a wild bird thus far discovered contained six eggs, but in captivity the number is extremely variable. A fact of considerable importance is that when the birds are not provided with any means of arboreal nesting, or even a shelf on which to deposit their eggs, they usually lay a greater number of eggs than when an elevated nesting box or a nest such as that of a crow is available. I have had this happen in my own experience no less than four times, and have records of three additional instances. These are as follows—

ELEVATED NESTING FACILITY—	NOT PRESENT	PRESENT
Female No. 1	4 eggs	2 eggs
" " 1	5 eggs	2 eggs
" " 2	4 eggs	1 egg
" " 3	6 eggs	2 eggs
" " 4	4 eggs	2 eggs
" " 4	3 eggs	2 eggs
" " 5	3 eggs	2 eggs

In England Mr. St. Quintin records six sets of Temminck's Tragopan eggs averaging two each, all laid in elevated situations, the exact numbers being 2, 2, 1, 3, 2, 2. In fourteen instances of the breeding of this species in the London Zoo we find the general average to be about three, although in the undetailed list at hand the eggs of two birds may in some cases have been lumped under one figure. A note from the Amsterdam Zoo records that three female Temminck's Tragopans laid eighteen eggs, from which eleven young birds (five males and six females) were hatched. In the case of neither of these zoological garden records do we know whether the birds had the opportunity of using an elevated nesting place. In a note on some of the first

Tragopans bred in the London Zoo, however, we read that while the nesting facility was an open box fixed above the ground, yet the usual complement was seven or eight eggs. Inaccuracies in other respects in the same account make us rather doubtful of the exactness of the above statements. Ghigi is likewise vague, saying that the birds lay from nine to fifteen eggs, beginning late in March and continuing until May.

I have dissected two females which died during the breeding season. One had been sitting for a week on two eggs, and in its ovary three other eggs were well developed, far ahead of the general mass. In the other bird, which, earlier in the season, had deposited and vainly incubated two unfertile eggs, *five* ovarian yolks were largely developed, of which, in turn, *two* were almost fully formed, and would have been deposited within a few days.

While one can only theorize, yet all these facts—clear and indisputable (except in regard to the set numbers of those laid in the London and Antwerp Zoological Gardens) —seem to suggest that these birds are in an unstable transition state as regards nesting site, and it would appear at least that the number of eggs is adaptive to the condition of this nesting site.

One cannot think of these birds in a wild state as utilizing other nests than those of such birds as crows and ravens, and the eggs of the Tragopan would be considerably larger than the eggs of the original owners of the nests, so that more than two would be unsafe, if not impossible to incubate. But if, as would seem to be the case, these Tragopans nest at times on the ground, there we can see the advantage of a larger number of eggs—four to six being none too numerous for the parent to incubate and to meet the added dangers of terrestrial nidification. When we know how such birds as our flicker or yellow-shafted woodpecker can be made to increase a normal setting of about seven eggs to a consecutive depositing of six or even ten times this number, the stimulus being merely the daily removal of each egg as it is laid, we can readily appreciate the physical possibility of such adaptation as I have suggested in the case of the Tragopan. Certainly the first female which I dissected had begun incubation, with two well-advanced eggs still undeposited.

In my experience with the Temminck's Tragopan in captivity I have never seen the hen do more than pick up bits of twigs, as well as leaves and straw, and fly up to the half box in which she arranged them in the form of a rough nest, a structure without cohesion, so that, if lifted up, it would have fallen to pieces at once. Mr. W. P. Ryder tells me that a hen in his possession once built a very fair nest in a cedar, five feet from the ground, without extraneous foundation, one which held together for five days of incubation upon a single egg, the hen then deserting and failing to lay again. Incomplete though this is, it is worthy of note as showing that the nest-building instinct, in the case of some Tragopans, has advanced somewhat beyond the parasitical adoption of another bird's nest.

The eggs of this Tragopan are of a rather rounded oval and have very little gloss. The set of six collected by A. E. Pratt in China are of a pinkish cream-colour, closely speckled over the entire surface with dark reddish-brown. Several laid in captivity have a ground colour of rufous-buff, thickly speckled with dull rufous-brown. In length they vary from 51 to 57 mm., and in breadth from 37 to 42 mm.

The period of incubation is variously given as twenty-six to twenty-seven days, and twenty-eight days. I have timed two settings as exactly twenty-seven days. Several years ago I compiled a table correlating the duration of incubation both with the development of the chick at the time of hatching and its wild habits, and since then this interesting phenomenon has been observed and recorded by others. While I shall take this up more in detail elsewhere, it is pertinent to mention it here. The shortest duration of embryonic life in the group of Pheasants (some twenty-one days) is found among the junglefowl (*Gallus*) and such birds as the golden and amherst pheasants (*Chrysolophus*). In the firebacks (*Lophura*) it rises to twenty-three days; the chicks of silver pheasants (*Gennaeus*) spend at least twenty-five within the shell, while tragopans (*Tragopan*), as we have seen, vary from twenty-six to twenty-eight days. Peachicks (*Pavo*) sometimes take a full month to hatch. In the newly hatched junglefowl chicks we find the flight feathers only slightly developed, extending beyond their sheaths only a very short percentage of their ultimate length. On ascending the scale of increased embryonic duration, the large wing feathers become more and more developed and functional at the time of hatching, until in the tragopans, impeyans, and peafowl the chicks can flutter some distance upward to a perch on the very first day of their life. There can be no doubt of the abnormal condition of the Temminck's Tragopan chicks, of which an early keeper writes: "The young birds are not so strong as the young argus, and they are not able to fly until they are four or five weeks old." St. Quintin truly records that Tragopan chicks only a few weeks old can flutter from perch to perch like young thrushes or robins. A Tragopan chick has the primaries so greatly developed at the time of hatching, that the weight of these, dragging down the wing at first, makes them fairly cover the entire back and body, extending to the very caudal down.

We may carry this scheme of gradation farther and find it well demonstrated in the comparative size of the hens and the eggs. A red junglefowl hen, for instance, compared with the hen of a Tragopan, gives the following significant figures—

	Weight.	Body Length.	Cubic Size of Egg.
Tragopan hen	1	1	1
Red Junglefowl hen . . .	$\frac{2}{3}$	$\frac{5}{6}$	$\frac{1}{2}$

Thus we find that the junglefowl hen, while averaging three-quarters of the weight and size of the Tragopan, yet lays an egg of only about one-half the cubic contents.

We can safely assume that this gradation has its cause; probably the more need for the jungle pheasants to crouch and hide for the first few days of their life, and the larger, more conspicuous species, or open-haunting birds to escape by flight. Or, perhaps, the vital point at issue may be the roosting place. The tendency of the Tragopan to nest in trees is of necessity associated with an early development of flight in the chicks.

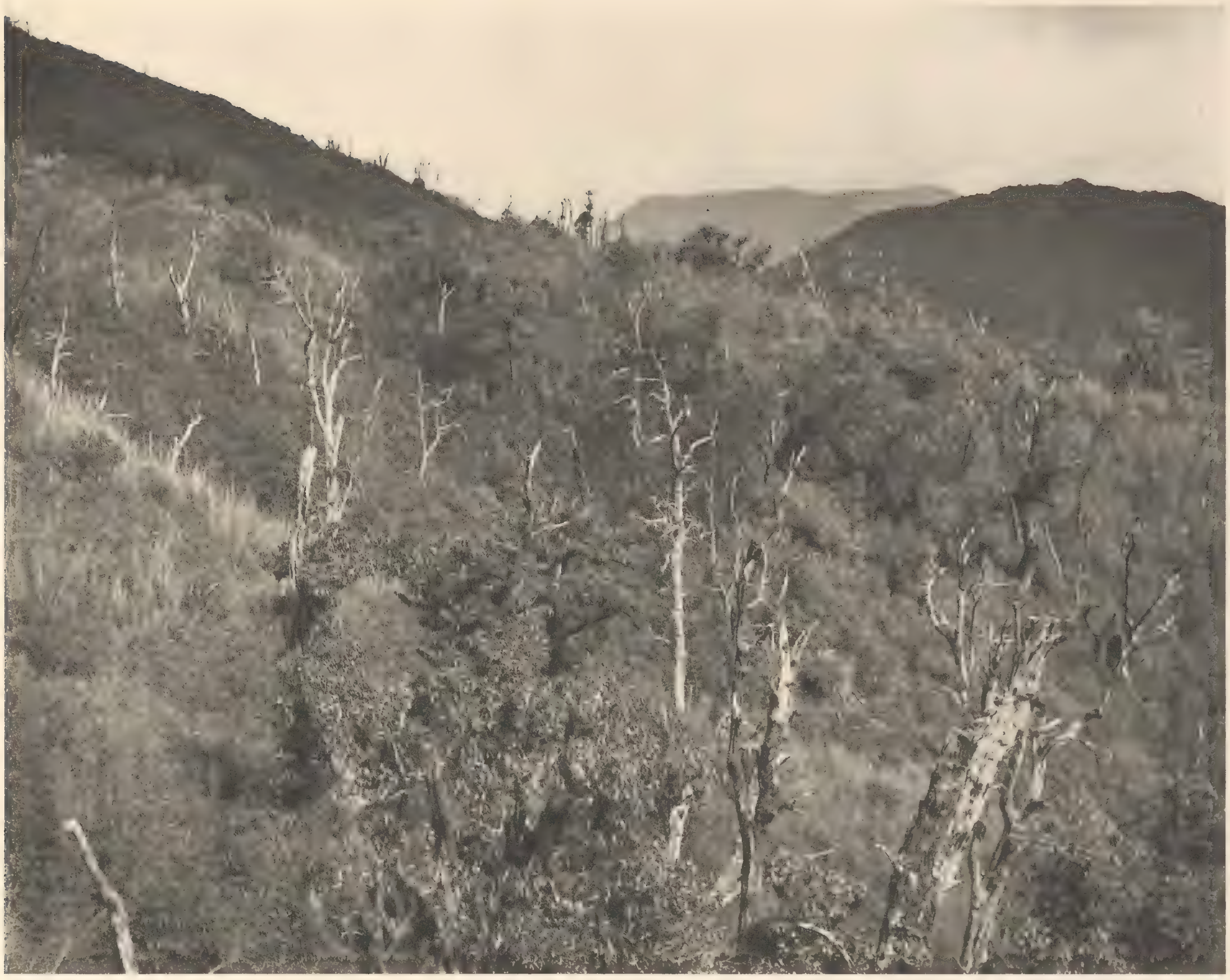
Whatever the exact cause, the evolved present-day result is of intense interest, and gives us a hint of the terrible complexity of the equations which Nature—*amunerbittlichst der Lehrers*—ever sets her earthly creatures—

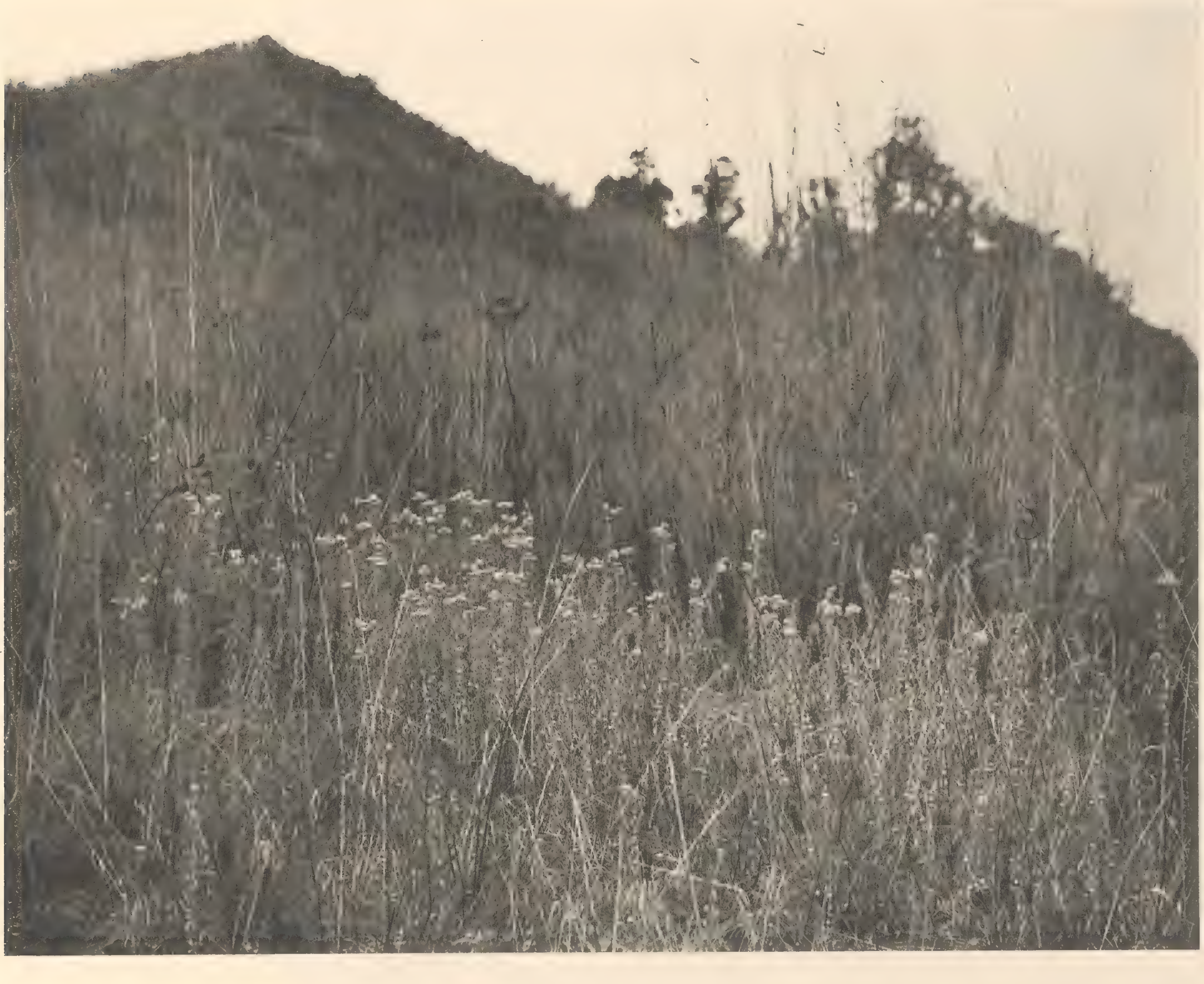
> Will small egg + short incubation + early flight + hiding ability = life or death?
> Does moderate size of body + large egg + long incubation + early flight = success or defeat?

PHOTOGRAVURE 7

YUNNAN HOME OF TEMMINCK'S TRAGOPAN

A cock Temminck's Tragopan was perched on the dead stub in the right-hand foreground ten minutes before the picture was taken. It leaped down and I secured it among the everlastings and bamboo stubble of the lower photograph. This was a typical Chinese wilderness devoid of trails or evidence of mankind, while the vegetation was gnarled and seared by the blasts which ever swept down from the snows. It was autumn and the leaves and trunks were as colourless as the overcast sky. Against this background the magnificent bird showed like a glowing coal.





YUNNAN HOME OF TEMMINCK'S TRAGOPAN

How many untold myriads of little downy chicks both in the hot, steamy depths of Malayan jungles and amid the cool, dark foliage of lofty Himalayan spruces have, through the ages, all unconsciously sought the solution of these problems! Let us at least give a single thought to the vast hosts which have failed, and then to the scattered remnants which have succeeded. And no problem is ever simple or detached. Each factor reaches out and touches some phase of hundreds of others, each of which, more or less directly, has its influence, perhaps an influence dimly hidden in the ancestral line, or developed a few minutes after the little chick hatches, or coming suddenly, for well or ill, from some far-off happening. Thus must we look askance at theories of evolution put forward as explanation of even the apparently simple fact, which do not humbly, but frankly, acknowledge the tremendous import of the *unknown factors*.

DETAILED DESCRIPTION

ADULT MALE.—Hind crown and occiput orange-red, the feathers elongated into a crest. All the rest of the feathered portions of the head black, including a wide band around the gular lappet and a nuchal collar. Facial area, chin and throat very sparsely covered with hair-like feathers. Visible portion of all the dorsal plumage Indian red, each feather tipped with a small pearl-grey ocellus set in black. Even on the mantle feathers there is a large black basal area, with pale buff bands or mottling, and as we proceed backward this expands and sends up a shaft-streak which joins the distal black area. When the feathers are in position, however, there is no visible trace of this generalized pattern and colour, so long are the lateral red barbs, and the effect is of a thick sprinkling of pearl-grey ocelli on a background of Indian red. On the least lateral disturbance of the feathers the sombre black, grey and buff appears and spoils the beautiful symmetry of the external pattern. Nature is, indeed, often chary of her specialized pigments, and allows no more than is actually necessary for superficial effect. The wing-coverts are similar to the back, the pearl-grey ocelli becoming larger and diffused on the longer coverts. The red and the ocellus disappear on the inner secondaries and the flights are black with numerous mottled bars throughout their length, grey on the secondaries and buff on the primaries. The longest upper tail-coverts are almost monochrome, the red diluted to dull brown, covering all the exposed part of the feather with the merest hint of a faint pearl tinge near the tip. The margins of these feathers retain something of the original strength of colour of the Indian red. The tail feathers are black at the tip, with the basal four-fifths mottled and banded as on the flights.

The under parts are of a clear, deep Indian red, the upper breast unmarked. Here, however, begins abruptly a zone of large, paddle-shaped, pearl-grey, subterminal spots which characterize every remaining feather of the under surface, becoming larger, but not diffused posteriorly, until on the under tail-coverts there remains little more than a narrow margin of the red. Basally on the concealed portion of the feather the red persists for some distance, then changes gradually to a warm orange buff, the pearl-grey spot being continued down the shaft into a basal dusky zone. There is no buff mottling as on the dorsal plumage.

Mandibles black, pale toward the tips; fleshy horns and facial area blue; gular lappet deep purplish blue, with margins and indentations deep salmon; legs and feet pink or reddish, deeper in colour at the breeding season. Length, 639; bill from nostril, 15; wing, 251; tail, 215; tarsus, 76; middle toe and claw, 66 mm.

Adult Female.—In the large number of females of this species which I have examined, I have found considerable variation, more, however, in tone than in pattern. The general hue of the bird may vary from a cold grey, almost as in *melanocephalus*, to a warm rufous throughout like the female of *satyra*. Most of this variation in hue is due to wear. A recently moulted bird is warmly rufous, a bird during or just after the breeding season is correspondingly bleached and grey. The crown of the head is black, with conspicuous—either grey or buff—paddle-shaped shaft-stripes. The nape in all specimens is decidedly tinged with rufous. The upper parts present a mingling of vermiculation, of buff or grey and black, accented by central whitish patches, and, especially in the rufous birds, with frequent masses of black. There are two subterminal ocelli, which are very well developed on the upper mantle and the wing-coverts. They form very marked elongated patches on the outer web of the tertiaries. The flights are quite fully marked with irregular bars on the outer, and mottling on the inner webs. The tail is irregularly barred with mottlings of grey or rufous as the case may be.

The chin and throat are nearly uniform ashy white or buff. On the sides of the face and neck each feather is outlined with black, while on the throat a central whitish area appears, accompanied by the invariable two black ocelli. The white centre is the chief characteristic of the ventral plumage, expanding rapidly posteriorly into a large oval patch or ocellus, the black having disappeared. The white area is surrounded by a faintly vermiculated broad buff or grey border. Iris brown; legs and feet greyish flesh. Bill from nostril, 14; wing, 223; tail, 175; tarsus, 69; middle toe and claw, 58 mm.

Natal Down.—A day-or-two-old chick of Temminck's Tragopan differs from that of the satyr chiefly in the darker colour of the down. The head and hind neck are more chocolate rufous than orange, while the back and the tail tuft are very dark mahogany. The chin and under parts are pale buffy white with no warm yellow tone, although the throat is more lemon, less cold buffy-white than the belly. The breast is tinged with brownish. The well-grown flights are dark brown, tipped with pale buff, and have several bands of black and pale buff across the outer webs. The sprouting scapulars show as very pale buff, broadly margined with black. There are no distinct facial markings. A chick measures: bill from nostril, 5; wing, 57; tarsus, 25; middle toe and claw, 23 mm.

First Year Plumage, Male.—The young males after the first autumn moult are, as usual, almost indescribable from the extreme variation, due to the condition, either retarded or advanced, of the adult pigment synthesis in the blood. Very rarely do we find an individual clad in the full, dull, female-like plumage, but almost always the head and neck (last to moult the down and the juvenile dress) are far ahead of the body plumage. When this full immature garb is attained, we find the head and neck to be clad in dull brown feathers, those of the crown with few or no markings, while the chin and throat are streaked with white. By far the more usual plumage of the first year male is a black crown, more or less tinged with brown and dull red. Around the neck, as in *melanocephalus*, we find a bright collar, dull orange-crimson at the back, and usually orange-yellow across the throat. From here posteriorly the typical first year plumage is a cold grey, mottled and irregularly banded with black above, while below, from the breast backward, a central lighter area appears, increasing in size until on the belly it dominates the faint buff and grey mottling. Only on the tertiaries and inner secondaries do we find well defined the black lateral ocelli, which are so characteristic of this plumage in some other Tragopans. They are scarcely traceable on the scapulars and back. The secondaries are dark brown, coarsely barred with sandy buff, while the barring and mottling on the primaries is much more rufous.

The tail, too, is exceedingly variable, the coarse mottlings being more rufous if an earlier moult has taken place, or greyer and darker if the plumage as a whole is more adult. Whatever curious pattern and haphazard half-and-half plumage is acquired at this moult, is retained in all its particoloured bizarreness until the succeeding annual shedding of the feathers. There is no "gradual assumption" of adult colour in any sense other than the accidental individual bodily condition at the time of renewing the plumage.

In individuals which acquire somewhat more than usual of the adult colouring at this first autumn moult, the transitional condition of the breast spots is most interesting. The pearl grey appears as a pigment, and one finds the remains of the white immature spots in all degrees of obliteration, sometimes only as a trace on a few barbs. Likewise the rufous edging appears here and there as a faint reddish tinge. First year males have the bill from the nostril about 15; wings, 223; tail, 178; tarsus, 76; middle toe and claw, 66 mm.

At the time of this moult we find the spurs little more than flat nodules. In the majority of individuals there is little or no thinning of the throat feathers during the first year, the streaked dark and white feathering being as dense as in the hens.

SECOND AUTUMN MOULT, MALE.—Just as we have seen that, during the first year, young males are almost invariably clad in a particoloured garb, with their heads and necks precociously hued and patterned, like a boy in knickerbockers wearing a high hat, so at the succeeding moult, if we are fortunate enough to get a bird at exactly the right period, we find the opposite condition existing. Here, again, the moult of the entire body precedes that of the head and neck by an appreciable time, and I have seen a September bird, apparently fully adult as regards body plumage, with the head and neck of a most unkempt mingling of youthful and pseudo-adult plumage. The rapid and irregular shedding of the feathers of the throat adds to the disreputable appearance; a bird clad in deep crimson, dotted with pearls, with a head and neck which look as if the owner had passed through some terrible calamity, caught, perhaps, in a snare, and escaping only after much tugging and disruption of plumage! At this stage the primaries have nearly completed their moult.

The very blunt spurs are now 6 mm. in length and the wing and tail measure respectively 233 and 178 mm. One of the changes occurring at this moult is a slight lengthening in the wing and tail feathers and a darkening of both. This brings us to the fully adult male.

EARLY HISTORY AND SYNONYMY

Long before any member of the white race had set eyes upon this bird, it had become familiar through coloured pictures drawn on Chinese rice paper. For many years these were thought, dragon-like, to be bizarre figments of the fertile Mongolian brain; but when the first bird was discovered it was found that some of these pictures were exceedingly true to life both in colour and pattern.

The first appearance in scientific literature appears to be the rather unhappy delineation in "Illustrations of Indian Zoology," to which Mr. J. E. Gray gave the name of Chinese Horned Pheasant, or *Satyra temminckii*. Considered on its merits as art, it is actually much inferior to some of the above-mentioned early Chinese paintings, while the black face and yellow marked lappets are wholly imaginary.

The male type which is in the British Museum is a most unhappy looking specimen with half of the tail cut off.

SYNONYMY—*Tragopan temmincki*

Satyra temminckii J. E. Gray, Ill. Indian Zool., I. 1830–32, pl. 50; G. R. Gray, List of Birds, Pt. III. 1844 Gall., p. 28.

Tragopan temminckii Bennr., Proc. Zool. Soc., 1834, p. 33.

Ceriomis temmincki Gray, Genera of Birds, III. 1845, p. 499; Blyth, Cat. Mus. Asiatic Soc., 1849, p. 240; Swinhoe, Proc. Zool. Soc., 1863, p. 307; Sclater, List of Phas., 1863, p. 11, pl. 11 [China]; Gray, List of Gallinae, Brit. Mus., 1867, p. 41; Gould, Birds of Asia, VII. 1869, pl. 46; Gray, Hand-List of Birds, II. 1870, p. 262; Sclater, Proc. Zool. Soc., 1870, p. 164 [N. & E. Szechuen to C. China]; Jerdon, Ibis, 1870, p. 147 [Upper, Assam]; David, N. Arch. Mus. Bull., VII. 1871, p. 11 [Szechuen]; Swinhoe, Proc. Zool. Soc., 1871, p. 399; Elliot, Mon. Phas., I. 1872, pl. 24; David and Oustalet, Ois. Chine, 1877, p. 118, pl. 112 [S. W. China to S. Shensi]; Hume, Stray Feathers, VIII. 1879, p. 201 [Mishmi Hills]; Sclater, Proc. Zool. Soc., 1879; p. 117, pl. VIII. fig. 3; Seebohm, Ibis, 1891, p. 379 [W. Szechuen]; Mitchell, Proc. Zool. Soc., 1911, p. 522 [longevity].

Tragopan temmincki Ogilvie-Grant, Cat. Birds, Brit. Mus., XXII. 1893, p. 275; Ogilvie-Grant, Handbook of Game-birds, I. 1895, p. 227; Oates, Game-birds of India, I. 1898, p. 251; Nehrkorn, Katalog der Eiersammlung, 1899, p. 192 [des. of eggs]; Sharp, Hand-list of Birds, I. 1899, p. 33; Oates, Cat. Eggs, Brit. Mus., I. 1901, p. 51 [egg]; Ghigi, Mem. R. Acc. Sci. Ist. Bologna, (5), X. 1903, pp. 394, 404, 406, tav. I, II. [physiology of horns and lappets]; Baker, Jour. Bombay Nat. His. Soc., XVIII. 1908, p. 753 [Burmese record, Panseng Pass]; Oates, Jour. Bombay Nat. His. Soc., XIX. 1909, p. 260 [first Burmese record, Sadon]; Finn. Game-birds of India & Asia, 1911, p. 31; Wilson, A Naturalist in Western China, II. 1914, p. 120 [general account]; Beebe, Zoologica, I. No. 15, 1914, p. 270.

Temminck's Tragopan St. Quintin, Avic. Mag., (1), 1903, p. 96 [breeding in captivity].

CABOT'S TRAGOPAN

Tragopan caboti Gould

Names.—Specific: *caboti*, for Dr. Cabot of Boston. English: Cabot's or Yellow-bellied Tragopan. German: Gelbäuchige Hornhuhn. Vernacular: T'u-shou-chi (Chinese, Hong-kong).

Brief Description.—Male: Head and neck black, except for a pale orange-red crest and a darker patch of the same colour on side of neck; feathers of upper parts with a large terminal buff spot, flanked with red and black; under parts plain buff. Female: General tone, dark russet-brown above, brownish-grey below. Considering the ground colour as black, the feathers are mottled and irregularly barred with pale rufous and buff, with a white triangular or linear subterminal white spot, very conspicuous on lower plumage; wing and tail feathers black, banded with pale rufous mottling.

Type.—China, purchased at Macao, near Hong-Kong. Now in the collection of the Museum of Comparative Zoology, Harvard University.

Range.—South-east China.

GENERAL DISTRIBUTION

When, far to the south, the rugged mountains of Yunnan have freed themselves from the erosion of the numerous parallel rivers, they swing to the east, forming, south of the Yangtze, a more or less unbroken range, the backbone of southern China. This mountain range skirts the lowlands of the Lung and West Rivers, shunting the rains to the north and to the south into the Laing, Yuen and North Rivers, and dying out only when its outlying foot-hills are bathed by the waters of the Pacific.

We know but little of this intervening country than that it forms a highway for many creatures of the earth, along which many have slowly found their way from the central Himalayan highlands. Among these is the splendid Cabot's Tragopan, notably distinct from its fellows, which has made its home here, almost fifteen hundred miles from the region where we found the satyr tragopan. How far to the west its range extends we do not know. I have a bird shot by Leland Smyth in the extreme south of Hunan (*circa* Lat. 26° N., Long. 112° E.), and a number of observers have found the bird to be numerous in north-western Fokien, while I have observed it somewhat south of that point. So we shall be generous in our estimate of its range if we demarcate it roughly as a scalene triangle with the bases at 26° N., 110° E., and 26° N., 117° E., and its apex at 28° N., 118° E.

GENERAL HABITS

The first mention of the Cabot Tragopan in a wild state is that of Abbé David, who says that, in 1877, he found it very common on the mountain chain which separates Fokien from Kiangsi. It was known to the natives by the same name as the Temminck tragopan, and its flesh was equally good eating. As during the months of October and November no males were observed in the plumage of the female, he believed that the Cabot Tragopan presented the unique peculiarity of assuming a complete adult plumage in the first year.

During the succeeding thirty-five years the few meagre facts recorded of this tragopan almost without exception have been drawn from the immediate neighbourhood of David's observations. By far the most important insight into the life history of the bird is the finding of four eggs, deposited and being incubated in an old nest of a squirrel, thirty feet from the ground. This nest was found by a native Chinese hunter near Kuatun, a small village in the extreme north-western part of Fokien. The facts of this discovery, as related by La Touche, are as follows: "Only four specimens were obtained by us during our stay at Kuatun; an adult male which had been trapped in March; a young male assuming adult plumage, trapped on the 30th of March; and two females, shot by our hunters in the forests on the 13th of April and the 17th of May. The latter bird was sitting on her nest when shot. The hunter who secured her, happening to look up into a large tree, saw a bird looking down at him, and, taking it for a Barbet (!), fired a charge of dust-shot, which, to his astonishment, brought down a fine hen Tragopan. He at once climbed the tree and found, on an old squirrel's nest of the year before, four eggs. According to the man's statement, the nest was about thirty feet from the ground. These are the first eggs of *caboti* obtained at Kuatun. The natives, having never taken the nest before, were much astonished at finding it so high up in a tree, as until then they had met with Pheasants' nests only on the ground.

"Of the four eggs brought to me, two were nearly ready to hatch, and two were addled, one of the latter being quite rotten. The remains of the young birds extracted from the fertile eggs have been deposited in the British Museum. The wings of the young birds have quills over an inch long. One of the eggs, now in Mr. Rickett's collection, measures 49 x 41 mm. The other three measure 61 x 41, 49 x 39, and 48 x 41 mm. The colour of these eggs is buff, thickly freckled with pale brown, the freckling coalescing in places. The texture is chalky. The shape is a short, broad, ovate in two eggs, and ovate in a third."

The fact that four eggs were found in this tree nest would seem to be an exception to the more general rule of two which I have demonstrated elsewhere, but the condition of these four eggs supports, rather than negatives, this assumption. It would seem probable that two of the eggs were laid, and although fertile (as evidenced by their addled condition) did not for some reason develop. The other two were apparently a second clutch which had been incubated until nearly hatched. In any event, even if all four eggs had been deposited at one time, there would seem to be some physiological difference dividing them into the two groups of two each. This recalls at once the condition of the ovary in the incubating Temminck's tragopan which I have mentioned.

But, aside from this point of view, I wish to re-emphasize this intensely interesting additional proof that the tragopans are breaking away from all normal phasianine standards of nidification, and paralleling the curassows and guans of South America. There seems little doubt but that the nest-building instinct is being acquired, and the first stage in the process is the adoption of the ready-made nests of other birds and of arboreal mammals, with the addition, as I have shown, of a slight lining of leaves and twigs.

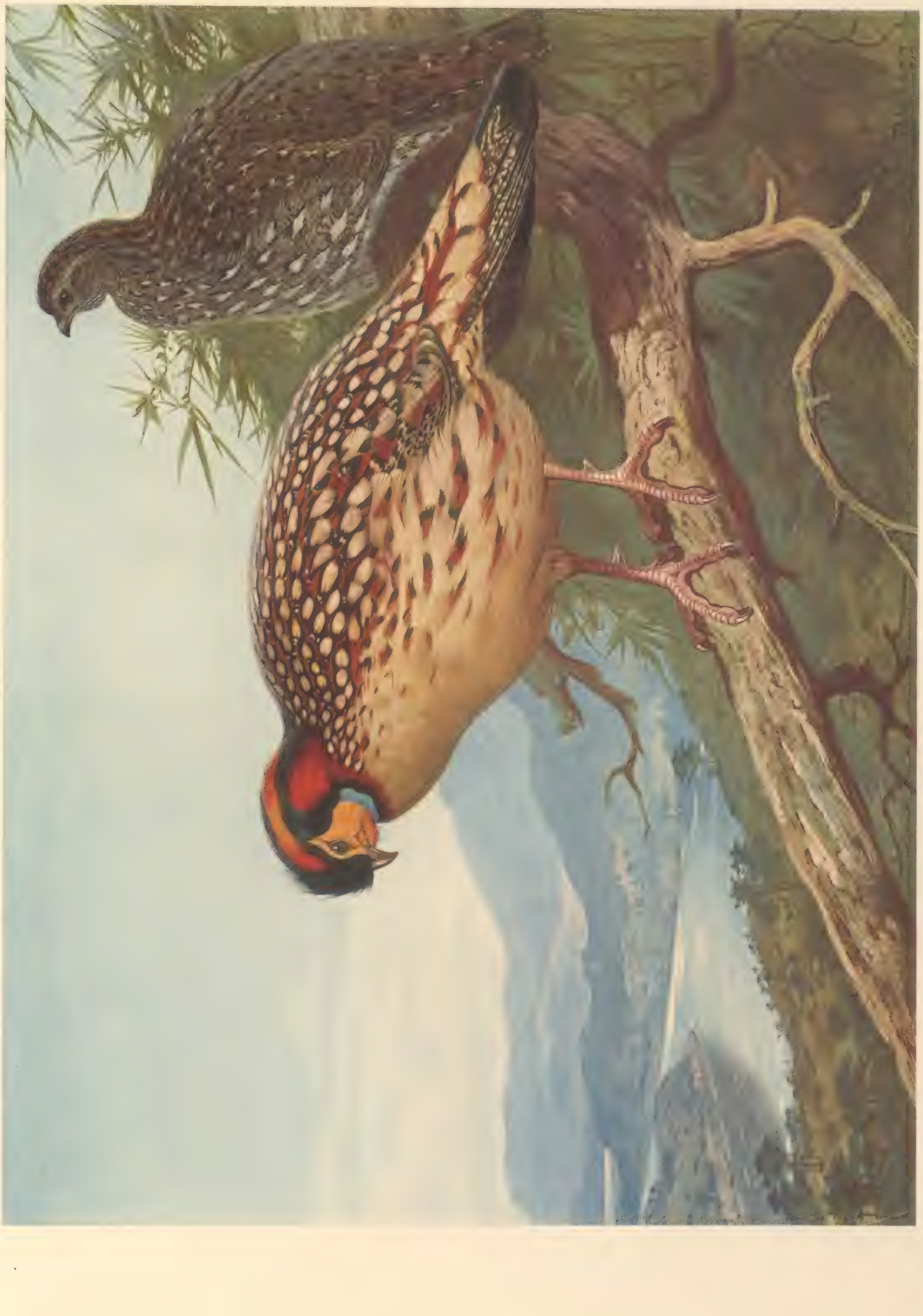
In the several collections of birds made at Kuatun eighteen specimens of the Cabot

PLATE XIII

CABOT'S TRAGOPAN

Tragopan caboti Gould

Hundreds of bird-lovers have this Tragopan living in their aviaries; probably less than a half dozen white men have seen it wild. In houseboat and sampan one can penetrate to their haunts in Fokien, but except for a quick shot at sight, one must have the patience and facility of a real wilderness creature to watch these wary birds undiscovered. They are surrounded everywhere in the valleys by Chinese, who plant their rice or bury their dead on every available spot. But the birds still hold their own in the face of a race which, while it has deforested the whole country, yet prefers rice and fish to a diet of game.



CABOT'S TRAGOPAN.

Tragopans are definitely listed: an adult male, three young males in transition plumage, and fourteen females. One of the males was shot on the 30th of March, while the other two were secured in the autumn. Unfortunately, no intensive study was made of any of these specimens, and we are wholly in the dark as to the details of weight, moult, feather wear, parasites, and the hundred and one other important facts, many of which only a freshly killed bird can supply.

My own experience with the Cabot Tragopan in China is soon told. One day in mid-March I was climbing a steep hill in west central Fokien. I had had good luck with other pheasants, but hitherto tragopans, for me, did not exist in eastern China. The going was difficult, through dense undergrowth dripping with moisture, and although it was not raining, the heavy clouds were driving past, sweeping the very mountain side and shutting out all distant view. Azalea-like blossoms made great splashes of cerise in the underbush. The muddy ground was slippery, and an occasional bare slope almost impossible to surmount. Finally I found myself on the summit of a ridge, on the farther side of which began the forest, the tops of the nearest trees down the slope being on a level with my eye. I rested here, panting in the saturated atmosphere and shivering in the dank, chilly mist. Babblers and hill-tits whirred, wet-winged, from bush to bush, or gazed curiously at me. My vision was limited by the fog to a radius of some thirty feet, and for a half-hour I contented myself by noting the birds which entered this area.

I was wholly unprepared, however, for the sudden emergence of a pair of tragopans—a hen in full flight, with a cock bird in close pursuit. For the space of perhaps five seconds they zigzagged in and out, threading the low brush, and then vanished into the forest silently as they had come. The first bird was unquestionably a hen, the second was certainly not in full plumage, but as certainly a cock Cabot Tragopan. My gun leaned by my side untouched, and for several minutes I gazed stupidly at the place where the birds had disappeared, and then at their trail; the vision had come so unexpectedly, had passed so quickly, it seemed a blur of the imagination. All further search during my brief stay proved fruitless, and I had to content myself with a specimen shot and brought to me by a Chinaman. It was a fully adult male, and I have elsewhere recorded the details concerning it.

The only knowledge we have of the food of these birds is that the crop of an immature male contained young leaves, while in an adult female the stomach contained acorns. The crop of my male bird was crammed with laurel-like leaves, giving as strong an aromatic odour as the favourite food-leaves of the Himalayan tragopans. Two small land mollusks were the only other objects in the bird's crop, while the gizzard contained only a little comminuted vegetable matter.

The elevation at which I saw these birds was certainly not more than two thousand eight hundred feet, although close to mountains of considerably greater height. The tragopans collected at Kuatun came doubtless from three thousand five hundred to four thousand five hundred feet elevation, the birds thus living at a lower altitude than any other species of the genus.

CAPTIVITY

Cabot's Tragopans are to-day not uncommon in captivity; perhaps, next to the Temminck's, they are most frequently offered for sale by dealers. These birds have been bred a number of times in captivity, but, like all the members of their genus, their constitution is not strong, and there seems no hope of establishing the species in captivity after it has been exterminated in its wild haunts. The first living male bird reached the London Zoological Gardens in 1882, and a year later a hen was obtained. Since that date a half-dozen or more have been exhibited. The length of life of these individuals has averaged about two and a half years, while one bird attained the record age of six years. The dozen old Cabot Tragopans we have had in the New York Zoological Park have withstood our more severe extremes of climate not as well as the London birds, and their terms of life have been considerably shorter.

Mr. W. H. St. Quintin has given the following detailed account of the breeding in captivity of Cabot's Tragopan: "As owing to their shy nature and to the dense jungle inhabited by the tragopans or horned pheasants, little opportunity presents itself of studying the ways of these birds while at liberty, or of investigating their breeding habits, the following notes upon three species which I have at the present time may be of some interest. In an enclosure of about five acres, including lawn, shrubbery, and a small meadow, where the grass is left to grow until haymaking time, well watered by a small shallow stream which runs through it, I have representatives of the Satyr, Temminck's and Cabot's Tragopans, pinioned and confined by a fox-proof fence of wire-netting.

"I have been much struck by the arboreal habits of all three species, and with the cleverness with which they walk along the boughs and thread their way amongst the dense branches of the shrubs and trees within their enclosure. It is necessary to be careful that no boughs extend to the fences, for they are always ready to take the least chance of escape. My Cabot's Tragopans, in particular, seem to spend a great part of their time in the trees, descending to feed, and afterwards hurrying back again, so that, except when feeding or dusting, they may generally be found perched, often in some shady yew, but, as a rule, not in the one in which they pass the night. Last year (1900), in the spring, I had no adult male of this species, but a hen bird laid two eggs in an old woodpigeon's nest, about ten feet from the ground. This year there was a fine adult male running in the enclosure, but the first clutch of three eggs laid in another pigeon's nest, which I removed and put under a hen, proved unfertile, perhaps from having been touched by frost. Early in May, she again laid in the same woodpigeon's nest, some 14 feet from the ground. This was in a yew, and, as in each of the previous cases, the nest was slightly lined with a few green shoots of the tree. I transferred these eggs to an incubator, substituting some guinea-fowl's eggs, which she took to at once. Of the Tragopan's eggs one was unfertile, but two chicks were hatched clothed with coarse, shaggy down of a chestnut colour, and with the primaries so far developed that on the first day they could flutter up and perch on the side of the yard of the foster-mother, to which I had transferred them. I had considerable difficulty in getting the chicks to feed. At last some small green caterpillars, from a maple, tempted them; then they began to take small garden worms chopped small, and ants' eggs. At the end of a week, when I had got them on to custard and fresh lettuce, in addition to the other things, I began to think that they would live. But they were much slower than chickens of the same age in taking to the foster-mother, and, until they learnt to return to the warm compartment, I had to shut them in at dusk, after their last meal, letting them out for another feed at 4 a.m. the next morning, and again confining them till I was about for the day. But during the daytime I kept them in the open air as much as the weather would permit. The cleverness in perching and climbing, so noticeable in the adult, was soon exhibited by the chicks. They would fly backwards and forwards between branches, which I fixed in their wire run, quite as neatly as any young passerine bird; and, if left a little later than usual at roosting time, I always found them sleeping side by side on a perch. I should imagine that in the wild state, the young would soon follow the hen bird and perch at night. As they grew they began to take a little hemp seed and wheat as well as a little custard, also earthworm, and little a fruit, of both of which last they were very fond. One of the two, the smaller bird, was attacked by a weasel, and killed before help arrived, but the other, evidently a young male, is alive and well, and already (Dec. 3, 1901) shows a good deal of bright colour in the plumage of the head and upper portion of the neck. Judging from specimens of these three species imported in the winter or spring, I feel sure that no further progress in the assumption of the male plumage is made until the full moult in the second year.

"In his Handbook to the Game Birds, Mr. Ogilvie-Grant refers to the Abbé David's opinion that this species of horned pheasant, of which a coloured plate is given, differs from the other members of the genus in getting the adult plumage in the first autumn. But this is clearly not so, and the young male Cabot's Tragopan, though differing slightly from the immature female in the pattern of the feathers, is equally sombre in colour, with the slight exception referred to above, until in the autumn of the second year the beautiful colouring of the male is assumed.

"The eggs are without gloss and of a buff colour, freckled with a rusty red.

"It is not, of course, safe to generalize too freely from a particular instance; but from the persistent behaviour of my bird during two seasons, it would appear that the female of this Tragopan is inclined to seek a nesting place off the ground."

In 1902 Mr. St. Quintin records that a second Cabot hen laid "her two eggs in a pigeon's nest about eight feet up in a spruce tree. She was watched lining the nest with dead twigs which she broke off the neighbouring branches, adding considerably to the original structure."

DETAILED DESCRIPTION

ADULT MALE.—Head black, save for the central and rear elongated crest feathers which are orange, paler, at base. The black extends backward well down on the neck and borders the bare facial skin and the throat lappet. On the side neck, commencing below the ear-coverts, is a large patch of Indian red, extending on the sides down to the body pattern and in front as a second complete throat band, beneath the black.

On the hind neck we find a sudden transition from the black to the typical pattern of the upper parts—a conspicuous rounded spot of buff and two lateral spots of Indian red, all framed in black. This forms the specialized, visible part of the upper plumage, giving the bird the general appearance of being thickly spotted with buff on a black and red background. When the plumage is in exact alignment the pattern is of alternate longitudinal stripes of buff, black, red, and black.

Radiating outward from the mid-back to the limit of the pattern on the sides, flank, wing-coverts, and tail-coverts, we find a regularly successive diminution of black and increase of buff, until the entire visible half of the feather is buff with a narrow lateral frame of red.

On the slightest disturbance of the plumage, however, the generalized median and basal patterns become visible, showing as spots and bars of pure white, orange and buff. A feather from the lower hind neck shows, in addition to the typical terminal markings, four short, transverse bars of white, and a fifth spot at the edge of the disintegrated basal area, while a semicircular band of buff continues the third white bar. This portion of the feather is clearly the unchanged, more ancient, pattern, typical of the female and young male. The warm orange of the small coverts near the bend of the wing is like the crest in hue.

On the breast we find as abrupt a transition as on the upper parts, but even more extreme, from the uniform deep Indian red of the throat band to a plain pale buff which extends over the entire breast and belly. At the base of the feathers are distinct traces of diluted orange pigment, reminiscent of the red, but on the whole the feathers may be said to be monochrome. This is the most specialized colour of all this genus, exceeding in this respect even the ventral plumage of Blyth's tragopan. Approaching the flanks, thighs and under tail-coverts, the orange increases as a marginal stain and ultimately merges into the typical dorsal pattern.

The most generalized feathers are, as usual, those of the wings and tail. A hint of the buff and red pattern extends even on to the inner secondaries, but the flight feathers as a whole are similar to those of the female, except that they are whiter, showing less rufous brown. Most of the outer webs of the alulae are clear buffy-orange.

The tail loses the buffy markings and mottlings at the tip, a broad terminal black band being thus produced.

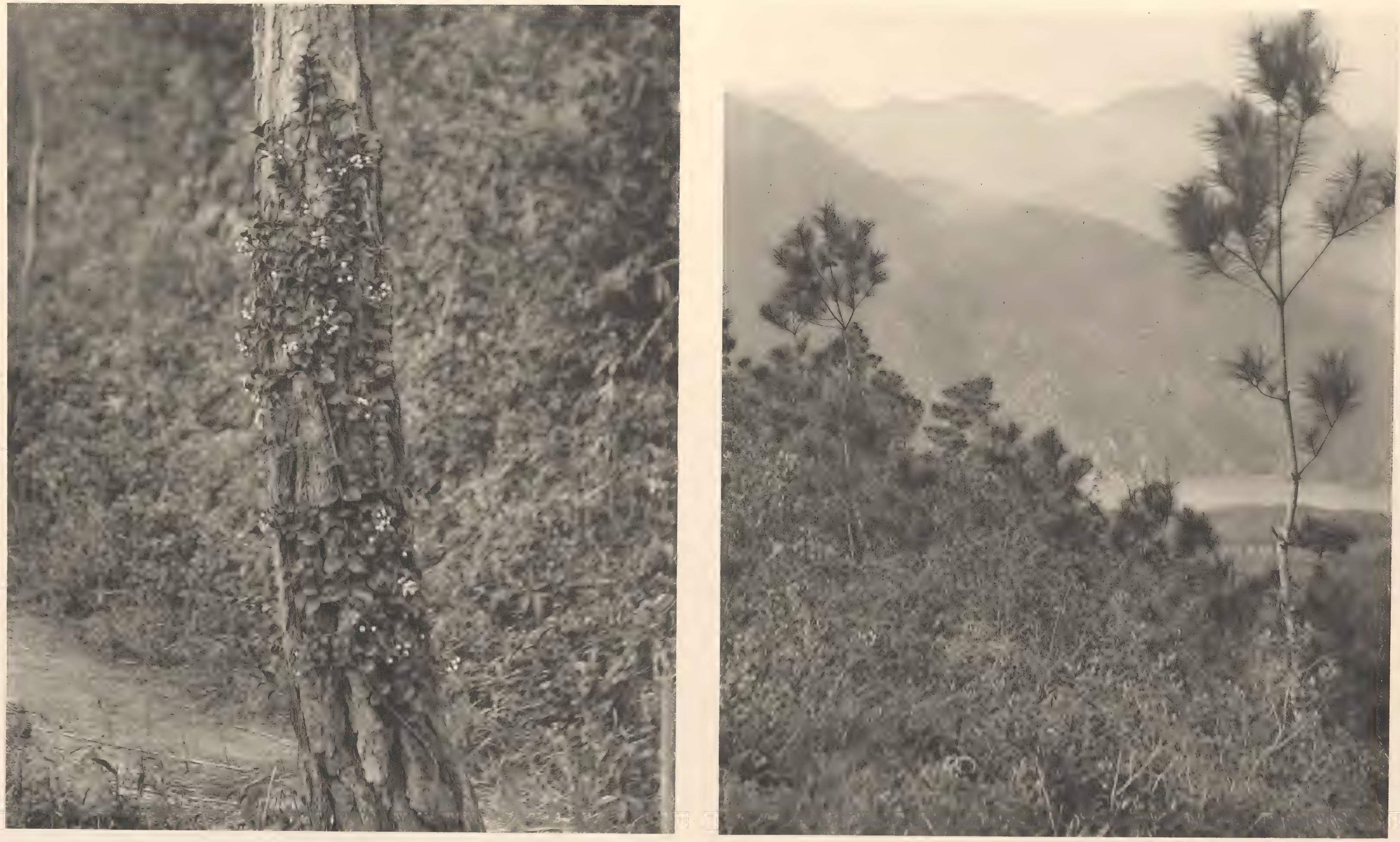
The bare facial area, broad band over the eye, and the chin and throat are clear bright orange, only a shade lighter than the crest feathers. A conspicuous fold of skin forms a median wattle down the centre of the chin and throat. If the breeding season is near there is a thick roll or fold of wrinkled skin along the lower end of the throat wattle—the courtship lappet—which is cobalt blue, changing to green where it touches the black feather band across the upper breast. Both colours show a silvery sheen.

In a bird in full breeding condition the face, chin and median throat wattle are brilliant orange. The horns are 50 mm. in length and pale blue. The eyelid is violet purple. The throat wattle opens out on the lower throat and forms the whole centre of the lappet or shield. When this organ is extended the orange separates into a reticu-

CHINESE HOME OF CABOT'S TRAGOPAN

The distant Min River flows through Tragopan country, whose mountain slopes are studded with pine saplings and spots of gorgeous azaleas. The second-growth and tangled turf and dwarf bamboos make rapid progress impossible for anything larger than a pheasant.

Into this cleared space there dashed, without warning, a cock and hen Tragopan; they zigzagged back and forth, encircled the berry-covered tree and vanished into the scrub. The foliage dripped, the fog soon shut tightly down, and to my ears came only the occasional whirring of the moisture-laden wings of some passing small bird.



CHINESE HOME OF CABOT'S TRAGOPAN

lated pattern, a connected network of roundish orange masses enclosing separated spots of purple. Radiating out on each side to the periphery of the shield are fingers or bands of pale blue, darker near the neck and paling to a cerulean blue tinged with green. There are nine of these bands on each side, with wider interspaces of buffy grey. They are connected at their base by a wide longitudinal band of blue, and along the margin most of them touch and merge with a narrow band of the same colour.

The lappet is 150 mm. (six inches) long and half as wide. A few elongated, hair-like feathers are scattered about, one in the centre of each purple interspace in the central orange area. The lappet is distinctly bilobed at the end.

Iris hazel brown; feet and legs pinkish-red. Length, 610; bill from nostril, 15; wing, 235; tail, 213; tarsus, 71; middle toe and claw, 65 mm. Average length of spurs, 10; height above hind toe, 21 mm. Two fully adult male birds in my possession each possess a spur on only one leg, the right in one case and the left in the other, the missing spur being represented by a flat nodule similar to that of the hen.

ADULT FEMALE.—Forehead and crown black with a broad pale buff shaft-stripe and tipped with chestnut, this colour being strongest on the feathers of the occiput. Even on the crown feathers some individuals show spots, or other markings of buff, half way to the base, already hinting at the delimitation of the terminal black ocelli. On the nape and neck these markings become more abundant, and the mantle feathers show the ocelli clear and distinct. We find these on almost all the dorsal feathers, but of less conspicuous character than the white streaking. This is especially true of the mantle, back and wing-coverts, on which a central white area is well developed, very pure and conspicuous, usually narrow and streak-like, but occasionally wider and pointed. The general tone of the upper plumage is dark brown, grizzled with buffy-grey in some individuals, while others are of a much warmer, more rufous tone. The secondaries are black, with a series of very regular, triangular, buffy indentations on the outer web broken by mottling, but simulating six or more crossbars in the closed wing. The primaries are dark brown with very slight buffy mottling on the outer margins. The rectrices vary in general tone with the individual, but always show transverse mottled bars of rufous, pale buff and black.

The feathers of the face, chin and throat are either white with black margins, or of a creamy whitoue tlined in pale buff. The under parts in correspondingly variable individuals may present a cold grey tone or be suffused with a warm buffy hue. The dominant character, however, is the very large, conspicuous, white central spots, which extend from the upper breast to the largest under tail-coverts, and, in the aggregate, equal or exceed the marginal mottlings. The striped throat gives way at once to grey or buff mottled feathers, presenting the central white area and the lateral black ocelli well developed, and the change posteriorly is chiefly in the increase in size of the white.

The upper mandible is pinkish horn colour, with the tip and the lower mandible lighter; the iris hazel-brown; the eyelids and cheeks reddish-orange and, what has escaped the attention of all observers, the entire chin and throat, as far back as a line drawn between the quadrates, is even brighter orange, the skin being much wrinkled and creased, corresponding to the lappet of the male Tragopan. The legs, toes and claws are dark pinkish horn colour, the latter paler at the tip.

Length, 505; wing, 214; tail, 165; bill from nostril, 14; tarsus, 63; middle toe and claw, 57 mm. Weight about 2 pounds. The spurs are represented by flat nodules, about 16 mm. above the hind toe.

JUVENILE PLUMAGE.—The head and neck of a five or six weeks' bird show abundant remains of orange-rufous down, while the body is clad in complete juvenile plumage. Crown feathers sprouting, black, with conspicuous narrow, pale buff, shaft-streaks. On the nape and posteriorly this pale buff area increases until it occupies the entire visible portion of the feather, save for two large, lateral, rather square-cornered black ocelli. The extreme of the light colour is reached on the mantle, back and median coverts. Posteriorly, while the black ocelli remain strongly developed, the buffy white diminishes to a narrow terminal shaft-streak, the rest of the feather being mottled rufous-buff and black.

The flights are dark brown, mottled only along the margin of the outer web with pale rufous. On the longest tail-coverts the buffy-white area becomes prominent again. The rectrices are narrow and pointed, pale rufous, mottled and irregularly banded with black.

The gular flap is well demarcated and but scantily covered with white down, the chin and throat down being of this colour. The breast is like the mantle, with a strong tinge of rufous. The rest of the lower parts are dominantly buffy white, sparsely and irregularly mottled along the margin with dark brown.

The primaries show active change. Nos. 1, 2 and 3 are feathers of the first year plumage; No. 1 three-quarters grown (66 mm. out of its sheath), No. 2 hardly a third of its ultimate length (28), while No. 3 is as yet a mere papilla sheath 5 mm. long. Nos. 4, 5, 6 and 7 are full-grown juvenile flights, awaiting their turn. The delayed outer three primaries are in full active growth. A bird of this age measures: bill from nostril, 10; wing, 138; tail, 91; tarsus, 42; middle toe and claw, 38 mm.

FIRST YEAR PLUMAGE, MALE.—One of the most conservatively coloured young males in this plumage is one shot in Fokien in October, having just about finished shedding the juvenile plumage. The head is, as a matter of course, particoloured, although less so than in most individuals of this age. The head, nape and neck, with their precocious colours and patterns disregarded, are feathered much as in the juvenile plumage, the feathers being black with conspicuous white narrow shaft-streaks. They become grizzled and vermiculated from the neck backward, and the white centre disappears at once, giving place to a dark grey mottled area, with the two black ocelli prominent as far back as the rump and the inner secondaries. The secondaries are dull brown, the outer web with a number of the usual broken, triangular, pale buffy indentations or pseudo-bars. The primaries have only a trace of marginal mottling. The central rectrices are indistinctly barred with black, buff and cream colour, the others becoming successively blacker and clearer as we proceed outward. Every one of the eighteen tail feathers are in full growth, the gradation being, as usual, from within outward. The chin and throat are well feathered with dirty white feathers tipped with buff. The breast shows irregular rufous mottling and a narrow oval shaft-streak of white, which increases on the lower breast and belly until it fairly dominates the marginal mottled area. The lower belly and vent are pure white, the under tail-coverts reverting to the mid-belly pattern.

The more usual type of colouring of a young cock of this age shows a blackish crown, with strong crimson markings on the nape and upper breast, a scattering of imperfect buff ocelli over the mantle and a strong buffy tinge to the ventral plumage. In some individuals we find the delayed outer primaries still far from their full length at the end of October. In other birds these are full grown at this time. A bird of this age measures: bill from nostril, 15; wing, 210; tail, 183; tarsus, 71; middle toe and claw, 64 mm.

As with the descriptions of other species of tragopans, so with Cabot's, various authors have expressed surprise at finding young males in "transition" and "changing plumage" both in the autumn and at the end of March. The particoloured garb attained at the first autumn moult explains all this, and does away with the need of invoking unseasonable and unheard-of moults.

First Year Plumage, Female.—Four females shot at the same time and place (Kuatun, Fokien) as the immature male described, show an interesting difference. The primary moult is about equal in the two sexes, the 8th of the new moult just finishing its growth, thus completing the series for this year. But while the rectrices of the male have all been shed within a short space of time, none of the tails of the females show signs of growth, although one or two of the feathers fall out at a touch, showing they were just about to be shed.

The female of this age still shows the dull buffy facial, chin and throat feathers of the juvenile plumage, while, as to the rest of the lower parts, there is considerably less white, the white ocelli being smaller, more buffy and the whole ventral plumage with a more rufous cast. The upper plumage shows little or no difference from that of the adult. The tail, however, is, of course, radically unlike that of the old birds, being narrow, pointed and with transverse bars of successive rufous, pale buff and dark brown, the central rectrices having as many as a dozen of these bars. The central rectrices of the adult have only seven or eight very irregular crossbars with wide intervals of black.

There is somewhat more of the buff mottling on the flight feathers than in the fully adult female.

EARLY HISTORY AND SYNONYMY

The early history of this species reveals nothing of especial interest. Even nomenclaturists have contributed nothing exciting; almost without exception, when they had cause to mention the bird, adopting the title first applied to it. When on a visit to the United States, in the summer of 1857, for the purpose of studying hummingbirds, John Gould examined the collection of birds belonging to Dr. Cabot of Boston. Among them was a specimen of tragopan which Gould borrowed, took to England and described in the same year, naming it, in honour of its owner, *Ceriornis caboti*. It was then returned, and still remains in the city in which Dr. Cabot lived.

Of the previous history of this specimen we know only that it came from China, and was said to have been obtained at Macao, near Hong-Kong.

Nothing more was heard of Cabot's Tragopan until Robert Swinhoe, six years later, purchased a young live bird from a dealer in Hong-Kong, which he shipped to Calcutta, but the bird died on the way. The first live bird reached England in 1882.

By recent search I unearthed the type of Cabot's Tragopan, a badly mounted bird which, until I inquired for it, had been hidden away in the storage collection of the Boston Society of Natural History. I have been able to study the bird carefully and compare it with other specimens. The small label bears the inscription, "5673 Ceriornis caboti, Gould. *Type.*" This individual, as we have seen, was the subject of the plate in volume vii of Gould's "Birds of Asia."

The type is in general adult plumage, and there seems no excuse for the errors in the plumage of the head which the artist made, as the specimen shows no black beneath the lateral neck patch, while the rufous breast-band is well developed. The chin, too, shows the typical scanty growth of degenerate feathers, and nothing like the thick black chin plumage with lateral wattles as depicted on the plate. On the other hand, there is small wonder that the artist continued the mottling and barring of the tail to the very tip of the feathers, as one-quarter of the entire length of this organ has been neatly snipped away with scissors, thus removing the black band which is so marked a character of the adult male. On the outer tail feathers there is, indeed, a trace of the solid colour, but so slight that with but this one known specimen no one would have portrayed it. The imagination of the artist is clearly seen in the much too extreme attenuation of the missing feather tips. They are in reality much more rounded. Gould makes no mention of this imperfection, and we cannot help recalling the more commendable method of George Edwards, who, more than a century before Gould, removed all chance of error as to the length of the frayed tail of his Satyr Tragopan by "casting it behind a tree." The type specimen is now in the Museum of Comparative Zoology, Harvard University.

SYNONYMY—*Tragopan caboti* (Gould)

Ceriornis caboti Gould, Proc. Zool. Soc., 1857, p. 161 (original description, China), Birds of Asia, VII. 1858, pl. 48; Swinhoe, Proc. Zool. Soc., 1863, p. 307 [? southern China]; Sclater, List of Phasianidae, 1863, p. 11 [? China]; Swinhoe, Ibis, 1865, p. 350 [Juv.; Hills of Kwangsi ?]; Sclater, Proc. Zool. Soc., 1870, p. 164; Gray, Hand-List of Birds, II. 1870, p. 262; Swinhoe, Proc. Zool. Soc., 1861, p. 399 [south-west China]; Salvadori, Proc. Zool. Soc., 1871, p. 695; Elliot, Monograph Phasianidae, I. 1872, pl. 25; David and Oustalet, Oiseaux Chine, 1877, p. 419, pl. 111 [mountains between Fokien and Kiangsi]; Sclater, Proc. Zool. Soc., 1882, p. 421 [first male in captivity]; Sclater, Proc. Zool. Soc., 1883, p. 388 [first female in captivity]; La Touche, Ibis, 1892, p. 494 [Fokien]; Rickett and La Touche, Ibis, 1898, p. 333 [Kuatun, north-west Fokien]; La Touche, Ibis, 1900, p. 49 [Kuatun; nest and egg; colour of soft parts]; Rickett, Ibis, 1900 p. 59 [Yanakan, north central Fokien]; Salvadori, Ibis, 1902, p. 253; La Touche and Rickett, Ibis, 1905, p. 58 [central Fokien]; Goodchild, Bird Notes, 1905, p. 63; Mitchell, Proc. Zool. Soc., 1911, p. 522 [longevity].

Ceriornis modestus David MS., David and Oustalet, Oiseaux de la Chine, 1877, p. 419.

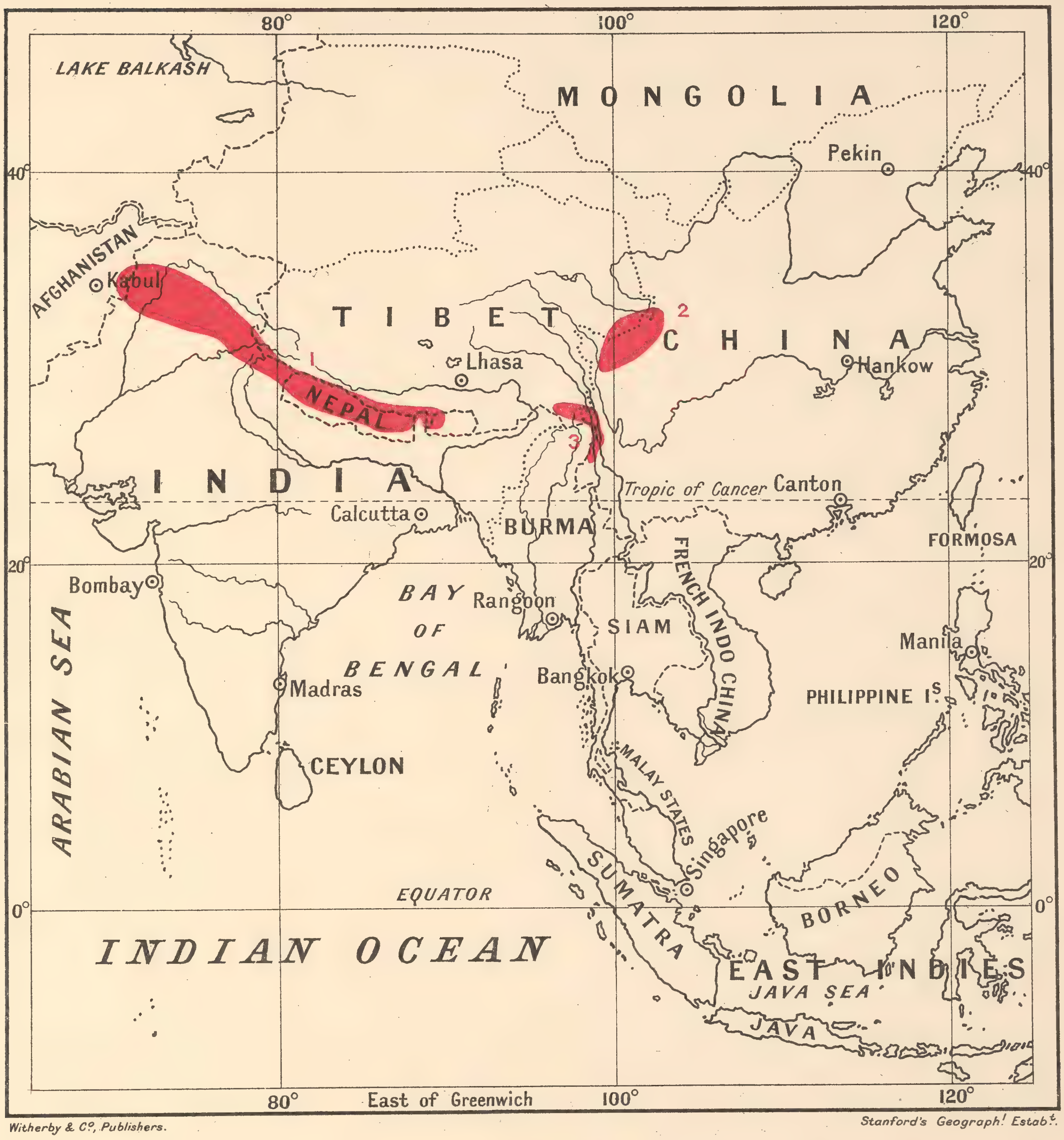
Tragopan caboti Ogilvie-Grant, Cat. Birds Brit. Mus., XXII. 1893, p. 277; Ogilvie-Grant, Hand-book Game-birds, I. 1895, p. 229, pl. XVIII; St. Quintin (quoted), Avicultural Magazine, 1902, VIII. 4, p. 73 [nesting in captivity]; Ghigi, Mem. R. Acc. Sci. Ist. Bologna, (5), X. 1903, pp. 394, 404, 406; tav. I, II. [physiology of horns and lappet; habits; description of ♀]; Ghigi, Arch. Zool., I. 1903, p. 297 [origin of the ocelli]; Martens, Jour. für Ornith., 1910, p. 448 [distinction between ♀ and juv. ♂]; Finn, Game-birds India and Asia, 1911, p. 31; Beebe, Zoologica, I. No. 15, 1914, p. 270.

Cabot's Tragopan St. Quintin, The Field, XLVIII, No. 2556, Dec. 21, 1901, p. 979 [nesting habits in captivity; moult]; St. Quintin, Avicultural Magazine, 3, 1903, p. 95 [breeding habits in captivity].

LOPHOPHORUS

IMPEYAN PHEASANTS

MAP IV.


80°
100°
120°
LAKE BALKASH
MONGOLIA
Pekin
40°
AFGHANISTAN
Kabul
TIBET
CHINA
1
2
3
Lhasa
Hankow
NEPAL
INDIA
Tropic of Cancer
Canton
Calcutta
BURMA
FORMOSA
20°
Bombay
BAY OF BENGAL
Rangoon
SIAM
FRENCH INDO CHINA
Manila
ARABIAN SEA
Madras
Bangkok
PHILIPPINE IS.
CEYLON
MALAY STATES
Singapore
SUMATRA
BORNEO
EQUATOR
0°
INDIAN OCEAN
EAST INDIES
JAVA SEA
JAVA
East of Greenwich

Witherby & C°. Publishers.
Stanford's Geograph! Estab^t.

MAP SHOWING THE DISTRIBUTION OF THE IMPEYANS.

Region 1. Lophophorus impeyanus.
,, 2. ,, lhuysii.
,, 3. ,, sclateri.

LOPHOPHORUS

IMPEYAN PHEASANTS

Family PHASIANIDAE

Subfamily PHASIANINAE

Genus *LOPHOPHORUS*

THE Impeyan Pheasants or Monauls are among the most brilliantly iridescent birds in the world. Three species are known, two of which are rather closely related, while the third (*sclateri*) is somewhat aberrant. In build they are even heavier bodied than the tragopans, their short thick legs giving them an exceedingly ungraceful carriage and an awkward gait. But the marvellous metallic sheen on the upper plumage of the males, running the gamut of bronze, green, blue and violet, eclipses all shortcomings. The lower plumage in this sex is usually dull black, while the hens are entirely unlike their mates, being chiefly dark brown, lined and mottled with buff. Both sexes of all three species have crests of sorts, racket-shaped, recurved or of normal feathers. The orbital region is more or less bare. The moult of the tail is truly Phasianine—from the outside inward.

The bill is remarkably stout and strong, and the upper mandible overlaps the lower, both at the sides and the tip, functioning as a fossorial organ. The wing is rounded, the primary formula from the longest running 5-6-4-3-7-8-2-9-10-1. The tail of eighteen feathers is of moderate length, and only slightly rounded, the outer pair of rectrices being fully six-sevenths the length of the inner pair. The tail is four-fifths as long as the wing. The tarsus is considerably shorter than the middle toe and claw, and is armed with a short, stout spur in the male.

The genus of Impeyan Pheasants is essentially of mountainous distribution, extending from the eastern part of Afghanistan throughout the Himalayan range to the central Chinese mountains where the birds range from north-eastern Yunnan, north to Kokonor.

As we shall see elsewhere, most unfortunate nomenclatural errors have arisen in regard to the specific name of the best-known species of Monaul or Impeyan Pheasant, but with the exception of a few unimportant synonyms the generic name *Lophophorus* has remained unchallenged. It was first used by Temminck about a hundred years ago in his " Histoire Naturelle Generale des Pigeons et des Gallinaces."

LOPHOPHORUS

	Type	
Lophophorus, Temminck, Pigeons et Gallinaces, II. 1813, p. 355	*Lophophorus*	*refulgens.*
Monaulus, Vieillot, Analyse (1816), p. 51	„	„
Lophofera, Fleming, Philos. Zool., II. (1822), p. 230	„	„
Impeyanus, Lessing, Traité d'Orn. (1831), p. 488	„	„
Chalcophasis, Elliot, Monogr. Phas., I. (1871), pl. xx. or pt. iv.	„	*sclateri.*

Three full species of Impeyan are known—

Himalayan Impeyan	*Lophophorus*	*impeyanus* (Latham).
Chinese Impeyan	„	*lhuysii* Verreaux and Geoffroy St.-Hilaire
Sclater's Impeyan	„	*sclateri* Jerdon.

KEY TO *LOPHOPHORUS*

I. Upper plumage metallic (males).
  a Tail entirely chestnut . . . . *impeyanus.*
  b Tail bluish green . . . . *lhuysii.*
  c Tail chestnut with a white terminal band . . . . . . *sclateri.*
II. Upper plumage not metallic (females).
  a Lower back not pure white.
    a' Crested; tail barred with rufous . . . . *impeyanus.*
    b' No crest; tail barred with white . . . . *sclateri.*
  b Lower back pure white . . . . *lhuysii.*

HIMALAYAN IMPEYAN PHEASANT

Lophophorus impeyanus (Latham)

NAMES.—Generic: *Lophophorus*, from the Greek *λοφος* crest, and *-φόϱος* a form of the stem to bear, hence crest-bearing. Specific: *impeyanus* after Lady Impey, wife of the first Governor of Bengal. English: Monaul, Moonal or Monâl, central Himalayan vernacular; Impeyan Pheasant. French: Lophophore resplendissant. German: Königs-Glanzsfasan. Vernacular: Lout [male], Ham [female], Nil-mor, Jungle-mor (Kashmir); Manal, Neel [male], Kururi, Karari [female], (Kullu); Moonal [male], Moonalee [female], Gharmonal, Rattia Cowan, Ratual (central Himalayas); Datiya (Kumaon and Garhwal); Dafia, Dangan (Nepal); Chamdong (Bhotia); Phodong (Sikhim); Chadang (Tibetan).

BRIEF DESCRIPTION.—Male: Head, throat and long racket-shaped crest feathers metallic green; nape and side neck reddish copper; mantle shining golden green; wings chiefly purplish-blue; lower back pure white; under parts dull black; tail rufous-chestnut. Female: Upper parts dull brown with a buff shaft-stripe on crest and longitudinal buff stripes and mottlings on other feathers, becoming regularly concentric brown and buff bare on lower back; lower parts paler, with conspicuous whitish shaft-stripes; throat and half-collar white; tail dark brown barred with rufous.

TYPE.—" Habitat, in India," Latham, Index Ornithologicus, II. 1790, p. 632.

RANGE.—The Himalayas, from Afghanistan to Bhutan.

THE IMPEYAN PHEASANT IN ITS HAUNTS

THE sight of a wild Impeyan Pheasant amid the lofty forests of its Himalayan home is vouchsafed to but few lovers of birds. Once seen it is never forgotten. Many times had I read over that graphic paragraph: " There are few sights more striking, where birds are concerned, than that of a grand old cock shooting out horizontally from the hill-side just below one, glittering and flashing in the golden sunlight, a gigantic rainbow-tinted gem, and then dropping stone-like, with closed wings, into the abyss below." Or again, in different words but to the same effect: " Looking at a stuffed cock bird in a shop window, or even alive in captivity, is very different from seeing him in his native mountains as he sails away over the blue depths of some wild, rocky gorge, where his loud, whistling cry is echoed and re-echoed among the neighbouring crags and precipices. Then is the time to see his splendid plumage to its best advantage, as the sun glints on the brilliant metallic hues of his neck and the dark purplish blue of his outstretched wings—colours so strangely contrasting with the snow-white patch on his back and the deep orange of his fan-shaped tail, which he always outspreads when in flight."

I had the good fortune to find Impeyans both in the eastern and the western Himalayas; in the former region, in early spring, the birds were just entering upon the season of courtship; in the west, a month or two later, they were already sitting upon their eggs.

My first view of an Impeyan or Monaul Pheasant formed a perfect antithesis to the vivid picture given above, but it was significant of an ever-present motif in the life of these and all birds, and served as a foil to enhance my later more cheerful studies of this pheasant.

On a windy, bleak morning in April, I toiled slowly up the steep slope of a rugged mountain in eastern Nepal. Scattered around me were splendid black silver firs, gnarled and twisted into the most fantastic shapes, and as I looked back, their knotty elbows ever arranged themselves in picturesque frames about the wonderful snows of Everest and Kinchinjunga. Earlier in the morning every needle had been frosted with the frozen mists of the night clouds, but these soon evaporated under the fitful glimpses of the sun, which now and then shone out. All day the great bunches of moss on trunks and branches oozed drops of icy water, which fell softly to the ground.

Now and then a dark cloud would surge up and over me and send down a shower of hail and sleet or a flurry of snow, the flakes finding me crouched and shivering, clinging close to the shelter of some century-beaten trunk. It was a day of extremes, measured both by space and time ; from the shelter of a huge, outjutting mass of mossy cliff I could see summer far below me, and upon the lofty snow slopes, eternal winter ; within a few minutes the icy blasts would give place to the full warm glow of spring.

The dark cloud passed, and the sunshine flooded me with its full strength. I saw the mosses under my hand full fruited, at my feet blue patches of forget-me-nots, while the buds of the nearest fir branch were bursting their winter scales. A flock of small birds worked down the mountain slope, one after another, searching rhododendron and conifer for food ; a half-dozen Sikhim cole and brown tits, the latter ever harping on their simple *see-e-e-e*. With them were two rufous pied woodpeckers, hammering, and calling loud attention to themselves.

An alpine meadow-glade sloped steeply before me among the hills, carpeted with coarse grass and stunted bamboo, the latter forming curious masses of balled foliage strung on low stems. From this harsh, arctic turf came sundry low squeaks and rustlings ; the life sounds of little furry voles. At the lower end of this uptilted meadow, two compact flocks of black-throated thrushes vibrated between their feeding ground among the grass and watch stations on the tall firs. From a dead tree farther down the slope a white-collared thrush called loudly.

I started again on my laborious upward climb, but scarcely had I ascended a hundred feet when the cold, clammy hand of the blue mist was laid again upon me, the birds swirled away, the sun blotted from view, and I shivered in the bitter dampness. I rested, panting from my exertions in the rarefied air. A black, shapeless shadow lay among the stunted bamboo above me, and when I reached it I found a cock Impeyan Pheasant, lying breast upward, dead, among the firs and rhododendron slopes which had been his home. The dreariness of the surroundings seemed enhanced ; the great mountains seemed cruel ; the cold winds more biting than before.

I examined the bird and found several great talon marks where some great bird of prey had struck and then, for unknown reasons, relinquished its victim. I slung the bird over my shoulder—a cuirass of burnished metallic hues. The next surprise waited for the scene to be shifted over a ridge, five minutes later, when the sun had broken through again, and far below me a spotted dove was cooing out its soul for very joy of life. Between two titanic halves of a split rock came a sudden rustle of great wings, and swiftly there flapped away on labouring pinions a golden eagle, and vanished beyond

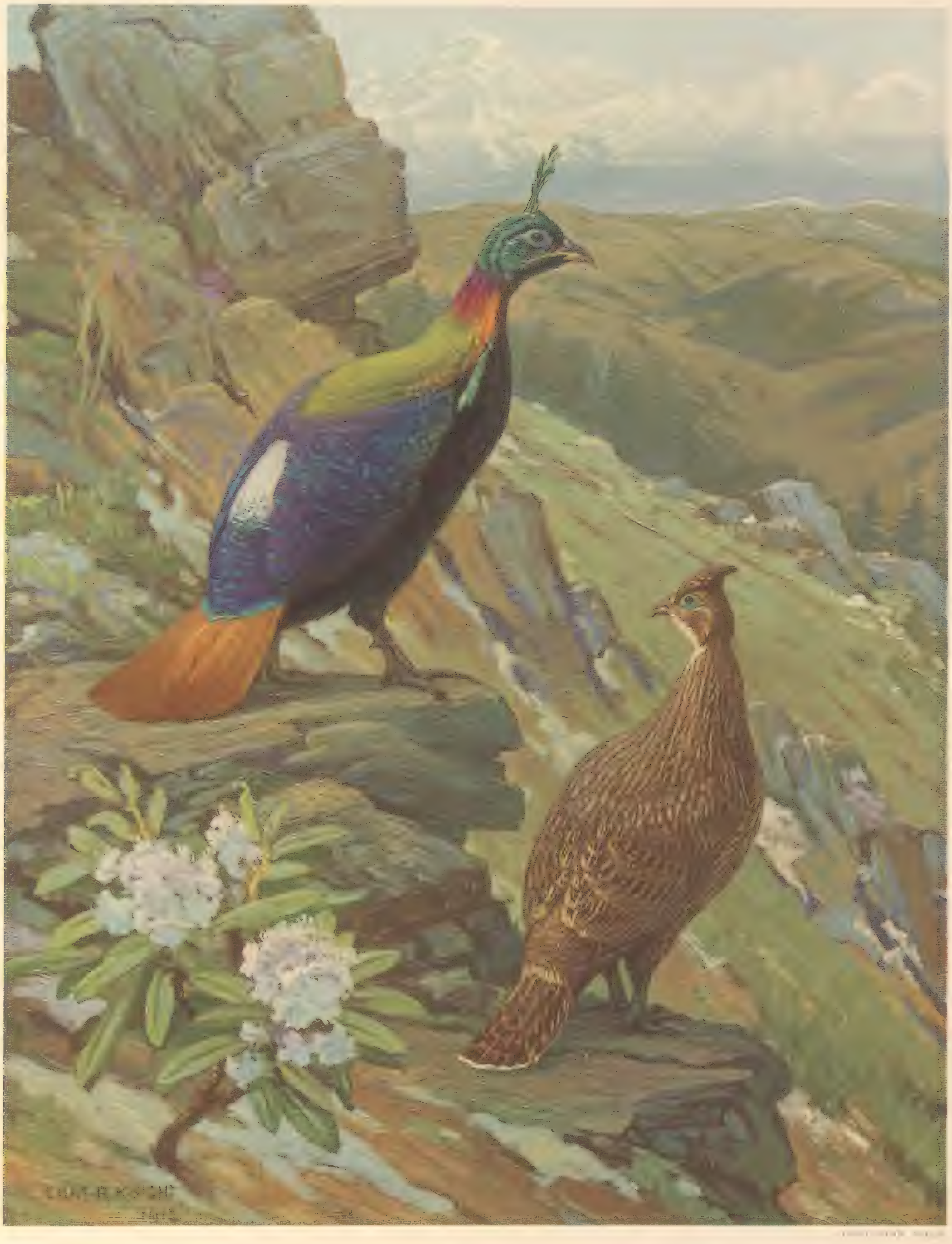
PLATE XIV

HIMALAYAN IMPEYAN PHEASANT

Lophophorus impeyanus (Latham)

From Afghanistan to Bhutan, along the whole range of the Himalayas, the Impeyan makes its home. Only the Blood Partridges live at a greater altitude. From one to three miles above the sea, the Impeyan feeds and sleeps and nests. There is beauty to be found in both the cock and the hen, but the colouring of the hen is the umber of dead leaves and the smooth brown of lichens, while the cock is a living mirror of iridescence. Yet life is possible to both amid the same surroundings; they face the same problems, make the same fight for existence in the face of dangers which threaten from the mountain slopes and from the clouds above them. And each year they rear their broods, which marks the success of their long battle against great odds. In this, they are but repeating the life of the generations before them; for the Impeyan chain is a long one. It reaches back unnumbered years to that mysterious time before the first men appeared—and the first links were formed long, long before human beings were present to watch the progress of this slow but courageous evolution.

PLATE XIV


CHAS. R. KNIGHT

HIMALAYAN IMPEYAN PHEASANT.

the sky lacery of fir needles. I went directly to the spot from which he had risen, and there found another tragedy—a cat-bear, whose fur of richest foxy-red was blowing thistle-like over the moss. The great bird of prey had made two kills in quick succession. Of one I robbed him, but the other I left as I found it. In the bewildering turns of the wheel of life, one's sympathy knows not where to abide; should I be sorry for the splendid cock pheasant cut down in the full spring-time, or for the harmless little cat-bear, upon which death swooped so suddenly while it was innocently grubbing for roots? or why not be glad for the appeased hunger of the helpless eaglets in their distant eyrie? Thus passed my first day in the home of the splendid Impeyan Pheasant.

GENERAL DISTRIBUTION

The Himalayan Impeyan may be said to occupy the entire Himalayan range of mountains. It has been found in eastern Afghanistan, and thence eastward through the north-west frontier provinces, Kashmir, Garhwal, Nepal, Sikhim, and for some distance in western Bhutan, as far, indeed, as any reliable records have been obtained.

If, however, we were to plot exactly the haunts of the Impeyan, we should find that it would become restricted to more or less narrow, long and sinuous fingers reaching here and there throughout the great chain of mountains, reflecting perfectly the high altitudes. The average life zone of the Impeyan lies between six and thirteen thousand feet. Stragglers have been shot after severe weather at four thousand five hundred, and an old cock bird has been seen sunning himself on a lofty, outjutting point of rock at nearly fifteen thousand feet elevation. With the snow cocks, blood partridges and tragopans it shares these lofty mountains, these birds being the only members of their family which exist at such altitudes.

Not only does the Impeyan require an elevation of from one to three miles above the sea, but it is typically an inmate of forests, more especially an open growth of conifers. These necessities sharply delimit its distribution, shutting it off equally from the low, hot Indian plains and the high, cold, but treeless Tibetan steppes. Within these limits, however, it is widely distributed and may be flushed after the first foot-hills have been passed, up to where, in the very innermost heart of the mountains, the firs and rhododendrons have shrunk to shrubs before the all-pervading cold blasts.

GENERAL HABITS

Like almost all the feathered inhabitants of these high regions, the Impeyan is decidedly migratory, in a purely altitudinal sense. In a word, the cold and snow force him downward; warmth and summer send him upward again *au ciel.*

They are hardy birds, however, and no false alarm of winter frightens them. The early snows may fall, and right thickly, without causing the Impeyans to shift their autumn feeding grounds, but when a constant depth interferes with their grubbing among the dead leaves, they wander slowly downward. At the lower elevations they enter the zones of oaks, chestnuts and magnolias, and in such surroundings spend most of the winter months. Occasionally a sheltered southerly slope will keep comparatively free of snow throughout the cold season, and in such locations Impeyans may sometimes be found at a considerably higher elevation than their usual winter haunts. Or again, a number of birds may delay their descent for a month or more by taking advantage of the comparatively bare ground in the dark coverts of dense rhododendron scrub.

Unusually severe winters drive the birds to seek food in the vicinity of the lofty Nepalese and other native hamlets, where the birds may occasionally be seen digging in the deserted fields. Impeyans probably suffer but little from snow and cold, for they are hardy and seem able to withstand very low, protracted falls of temperature provided they have an abundance of food. In their native haunts, instead of a journey of hundreds of miles as in the case of latitudinal migrants, a single leap into the air and a long, scaling flight often will carry them a full mile downward, where the snow has turned to warm rain, and in place of the frozen, dead turf, is fresh sprouting vegetation and abundant insect life.

Impeyan Pheasants seem to a large extent gregarious, but the ties between the members of a flock are extremely lax. In the autumn and winter considerable numbers will be found in close association, but the sociability seems dependent more upon available food than any innate covey instinct. This is shown by the irregular distribution of the birds on any favourite slope. If the food, such as grubs and certain edible tubers, is rather scarce and local, one may find from a dozen to thirty birds all within the limits of a few rods, busily feeding, while with an abundant and more generally distributed food supply, the birds will spend the colder months singly, at considerable distances from their fellows. This being the case, it will readily be seen that the same lot of birds working gradually down some great mountain slope, may seem extremely gregarious at a certain elevation, and not at all elsewhere. Another fact, aside from any actual covey instinct, which makes for the gathering of Impeyans into loose flocks in the winter-time, is the constriction of the actual livable areas as the upper regions are rendered uninhabitable by arctic conditions.

It is certainly true, however, that there is a distinct segregation of the sexes. In the autumn, the females, with their similarly coloured young of both sexes, wander downward earlier, and ultimately reach a lower elevation than the full-plumaged cocks. "On the lower part or exposed side of the hill, scores of females and young birds may be met with, without a single old male; while higher up, or on the sheltered side, none but males may be found." This more or less complete isolation of cocks and hens holds good until spring. Continued persecution for many years, on the part of natives, of the full-plumaged cocks for their feathers, has helped to bring about a slight or, in some places, well-marked distinction in the sex of Impeyans observed near villages. While this was recorded over sixty years ago, it is more true now than ever, and when Impeyans are driven down by heavy snowfalls it is seldom that any but females or young birds are ever to be seen in the fields within sight of the habitations of man.

No matter how loose are the ties between individual Impeyans, any hint of danger affects all simultaneously. "In winter, when one or two birds have been flushed, all within hearing soon get alarmed; if they are collected together, they get up in rapid succession; if distantly scattered, bird after bird slowly gets up, the shrill call of each as it rises alarming others still farther off, till all in the immediate neighbourhood have risen. In the chestnut forests, where they often collect in large flocks, and where there is little underwood, and the trees, thinly dispersed and entirely stripped of their leaves, allow of an extensive view through the woods," Wilson writes that he has "often stood still till twenty or thirty have got up and alighted in the surrounding trees."

In the spring, before the flights of early migrants begin to swing northward through the passes toward Tibet and Siberia, the Impeyans begin leisurely to ascend. They have only a foot of ground to cover for every mile of the other feathered migrants, but their goal is the same—the cool zone where they were born and where their parents' parents had nested before them. As a rule, the Impeyans carry on their migrations on the southern slopes, but in many of the hanging valleys birds from two wholly separate ridges intermingle in winter. As courtship does not take place at the lower elevations there is probably little physical intermingling, however, and, judging from all analogous cases, the birds from each separate slope or ridge return unerringly to their natal forest or heath, the young—or what are left of them—to some adjacent area.

As spring advances, all the Impeyans become wilder, and every hint of flock spirit vanishes. At this season, when one bird is flushed or alarmed by man or beast, the alarm does not spread, as earlier in the season, but each bird shows a tendency to delay its retreat until individually menaced. The first flight is almost invariably to a tree, especially if the assailant be a dog, but when again disturbed the bird puts a good distance between himself and the danger, settling this time upon the ground.

The season of the year is said to be all important in influencing the tameness or wariness of Impeyans. "In spring, when the snow has melted in almost every part of the forest, and they have little difficulty in procuring an abundance of food, they appear careless about being driven from any particular spot, and often fly a long way; but in winter, when a sufficiency of food is not easily obtained, they cling to particular localities, seem more intent on satisfying their hunger, and do not so much heed the appearance of man." The females, probably because their modest garb renders them more immune against attack both from sharp-sighted carnivora and the millinery hunter, seem always tamer than the cocks.

There seems little doubt but that the Impeyan has proved an unusually successful competitor in the life struggle which, century upon century, has been waged among the great heights and depths of the Himalayas. Although it is difficult to believe the statement of a professional millinery hunter that "hundreds may be put up in a day's walk," yet formerly the birds were unquestionably abundant in many parts of these great mountains. Especially was this the case in winter when the spreading downward of snow and frost concentrated the numbers of Impeyans at lower elevations. I shall elsewhere take up more particularly the relation of these pheasants and mankind, and shall here remark only that from end to end of the Himalayas, from the Simla or Kashmir sportsman to the hunter who makes his way northward from Darjeeling, one hears to-day only expressions of regret at the decimated numbers of these wonderful birds; birds which have wholly refuted all early hopes of semi-domestication.

The Impeyan is as inferior to the tragopan in its vocal utterances as in the dermal elaboration of its courtship display. The common call note is a shrill, loud whistle, with but little cheeriness. The only love call at the height of the courtship season which I have heard is this small call, louder and less lacking in the mournful, plaintive quality which characterizes it at other times. This brighter tone is due, however, solely to the greater vim put into the sound; the call in the main is the same. I have never heard the call note uttered by males when feeding in a loose flock in early spring, nor even when separating to roost for the night, but it is the common family signal used by the female and her young. The call of the latter, both males and females, even when in full first winter plumage, is appreciably shriller and higher than that of their mother, and when parent and offspring are calling alternately, it is always possible to distinguish between them. I have verified this more than once in the case of captive birds. The call note may be described as a high, reverberating whistle, bringing to mind the beat of a dove's wings in flight.

The hen Impeyan makes use of the call when anxious about her nest, or when separated from the chicks, and although I could never distinguish the slightest difference between the alarm note which was uttered while I was considered a dangerous intruder with the young somewhere near by, and the ultimate call notes, in which the young joined, as the family came gradually together again, there must have been some deep and important distinction clearly obvious to the young birds.

An Impeyan is feeding busily, flicking the dirt and leaves with strong picks of his great beak, when some sound near by, not made by the wind, reaches his sharp ears. He stiffens, stands upright and listens intently. The sound is repeated, but so muffled and subdued that he cannot tell from which direction it comes. But his deepest suspicions are not aroused, and he voices his nervousness in a deep *cluk ! cluk !* much like the suspicion or alarm note of the American robin. This utterance is very unlike the other notes of the Impeyan, and is called forth under exactly such circumstances as I have narrated. I have heard it from both wild and captive birds.

When, however, a cock Impeyan is suddenly alarmed, so that it leaps into the air and whirrs away, it pours forth from wide-open beak a rapid succession of shrill, screeching, whistling notes which can be heard at a surprisingly great distance. These can be considered only as multiplied, intensified, terror-induced modifications of the common call note: *weeeep ! weeeep ! weeeep ! weeeeeep !*

I was once hidden among the lower branches of an oak with my glasses fixed upon a distant cheer pheasant when I heard the sudden outburst of notes of fear. So full of potent agony were they, that I remember I started and thrilled with sudden sympathy. When one spends weeks and months of constant watching and concentrated interest, striving to fit together the glimpses of pheasants or some fortunate hour of observation into its proper place in their life histories, one comes unconsciously to view one's surroundings somewhat through the eyes of these splendid birds. When I found that the very best way to watch them was from a perch in a tree, or as I spent hour after hour of cramped agony in my tiny observation tent, I felt that the mortification of the flesh was perhaps compensated by the pheasant's-eye view of life I obtained while in such situations; in the first, I saw what the roosting pheasant sees, in the second instance I was compelled to exercise some of the patience which the tireless mother bird exhibits when giving up a full month of life to warm her eggs into dynamic vitality. And thus when the sudden cry, drawn from the bird unconsciously, through sheer terror, came to me, I too shuddered and breathed the quicker. My pulses did not lessen as I saw the bird itself coming full tilt toward me diagonally across a narrow gorge. Head on it came, wings bowed and vibrating, but with now and then a downward flirt of one wing as it ducked beneath a branch or swerved around a trunk. From the first glimpse of it far off through the spruces to the moment it alighted below me, seemed but a fraction of a second. Its alarm notes had died out long before it reached me, but the instant it alighted it began a breathless, half-articulated call note, and for two or three minutes it remained motionless, half crouched, with bill partly open, uttering at intervals its loud, plaintive call. Then it walked slowly away, and I saw no more of it nor did I ever learn the cause of its fright. This secondary utterance of the call notes seems to have no distinct purpose. I was told that the same thing occurs when a cock bird is thus suddenly alarmed in winter, when it can have no family or young to summon or warn. It would seem to be a mere reflex of the sudden nervous strain, and the bird is probably as unconscious of calling at such a time as is a person of his exclamations at a sudden fright.

The mother note of the Impeyan is low and subdued, a crooning, nasal, untranslatable sound, while the chicks have a whistling chirp that merges, with but little change except of depth and volume, into the call of the adult Impeyans.

The early morning calling is rather inexplicable. I have known of four birds, old and young, roosting at a certain place night after night, and yet, early in the morning, all four would regularly go through a period of repeated calling. The calling was less noticeable and of shorter duration when the dawn was lowering and cloudy than when the sun came over the mountains bright and clear. It seems probable that it can only be a mere concomitant of the nervous excitement of awaking and preparing for another day. When the birds begin to feed, the call notes cease at once, and during the day they are seldom given, unless the birds are forcibly separated by attack or, as we have seen, unexpectedly alarmed.

The Impeyan appears at his best when standing still, although even then the stoutness and thickness of his legs and feet give him a far from graceful figure. But, however much we admire his marvellous colouring, of his gait we can say little of praise. It seems to get him over the ground, and throughout his short life he doubtless covers many, many miles of stiff hill climbing, but to our eyes his waddling, plodding gait seems to savour of effort—something seeming decidedly wrong in the general proportions of bodily weight or balance and the lower limbs. But we may be certain that there is good cause for this, and I have sometimes wondered whether the gait of this bird, awkward as it appears on level ground as in an aviary, was not some direct adaptation for hillside clambering. The wide apart position of the legs would certainly be an advantage in clambering over coarse, uneven turf, and in such locations there would be little use for the swift, direct speed of other pheasants. The Impeyan apparently has need in life of just such strong, sturdy legs to enable it to climb about all day.

The food of Impeyan Pheasants is rather specialized, and yet varies considerably during the course of the year. Many writers have given the impression that it feeds to a large extent on some special form of large grub, and also on a particular edible tuber, but none enter further into details than this, and it is very improbable that there is any species of larval beetle or other insect which is so abundant and widespread throughout the Himalayas as to form a very dominant item in the diet of this pheasant. However, terrestrial insects and tubers do certainly form its chief food, but in every locality in which I have studied Impeyans, these differ widely. Whenever snow does not cover the ground, or the forest debris is unfrozen, Impeyans spend much of the day in digging among the moss and fallen leaves. It is in this work that their excessively heavy, overlapping upper mandible serves them well, and from the constant use of this organ it seems very reasonable that the connection between fossorial effort and its ponderous size is very close; it may, in fact, be considered a fossorial adaptation. The importance of this is more evident when we consider that the Impeyan very seldom makes use of its stout feet and claws for the purpose of scratching—the habit which is so nearly universal among gallinaceous birds. I have seen both sexes scratch the ground, but it was a half-hearted, awkward movement and effected little.

In the high forests of Garhwal and Kashmir I have watched the Impeyans at their communal feeding places and found every movement full of interest. At about ten thousand feet, in the still quiet of midday, I once came across a level shelf of long grass shut in by low spruces and deodars. The little glade was some dozen yards across, and part of it appeared to have been recently ploughed. Closer inspection showed abundant recent sign and some stray Impeyan feathers. The birds had evidently been working here for some time, and I prepared a blind a little distance away in a tree, from which I could see almost all the glade. The following morning a heavy downpour held steadily until daylight, but the succeeding night was clear, and before early dawn, lighted only by the faint greenish glow from the great mass of Halley's comet, I made my way from camp along the summit of the ridge to my station. Here I shivered and shook with cold for an hour or more until the first few sprinklings of morning songs had grown into a well-filled chorus, with an accompaniment of the two-phrased, reiterated song of a tiny green warbler. A koklass called far down the valley, and ten minutes later my first Impeyan appeared, stepping quietly out from the low trees and going at once to the edge of the glade, where he appeared to be picking at the long blades of grass. I had mounted my seven-and-a-half-power stereo-glasses with an elastic band on a small branch, and like a Gatling gun I could, with the slightest touch, swing it so as to cover the entire glade. A gentle push and the Impeyan came into the field, his metallic hues deadened by moisture and the early dawn, but the clear brown eyes flashing here and there as he plucked the heads of tiny flowers from among the grass and swallowed them.

For fifteen minutes nothing more happened, and then, for the space of an hour, Impeyans began to appear singly or in pairs, and once three together. Three other times I had been grievously disappointed while in hiding, and now it seemed as if I was to succeed in my concealment. Fourteen birds, every one a cock in full adult plumage, were now in sight. Most of the birds went at once to the diggings, and, stepping down into the hollows, began industriously to pick the earth away with strong, sweeping flicks of their great shovel mandibles. Not once during this observation did I see a bird use its feet in scratching. Some of the birds were in holes a foot deep, and, when working, only their brilliant backs were in view. They seldom worked more than three or four seconds without raising the head and giving a swift glance around and especially *upward* into the sky, and I imagine that the source of most of their troubles lies in soaring eagles. There was no fighting, but now and then an undignified scramble for some tuber or other edible morsel. One or two birds spent much of the time walking slowly about on the outskirts of the glade, but there was no systematic watch or sentinel duty, such as is well known among some species of birds. They were remarkably silent, only now and then a subdued guttural chuckle or a protesting whistle as one was crowded. Instead of scattering promiscuously over the whole of the glade, they were concentrated along the edges of the dug-over area, this being due probably to a zone of more abundant food. When a large tuft of grass or bamboo was encountered, the birds dug around it and under it until it was left supported by its bare roots, or in one case until it actually toppled over. The sight of more than a dozen Impeyans thus engaged was most remarkable, and when the sun rose upon them the colour effect was indescribable, fourteen heaving masses of blue, green, violet, purple, and now and then a flash of white, set among the green of the turf and the black of the newly disturbed loam. It was surprising how seldom one caught a glimpse of the white lower back. Only when some unusually violent effort made the bird extend a wing to keep its balance did the white gleam forth.

The most interesting phase of the whole performance was the absence of females and the fact that the Impeyans came apparently from different directions. Although I could not see the birds until they actually stepped out of the trees into the glade, I heard several times the loud beating of wings as if they had flown from some distant point. Certain it was that the Impeyans were nesting at this time, and I am equally certain that on the adjacent slopes were but two nests of these birds. We can only conjecture the cause of the segregation of the males at this season—a segregation which in other birds would result from combative reasons, but in these marvellous feathered rainbows was inspired solely by gastronomic desires. I was spying upon a veritable *café du Lophophore pour les hommes seulement.* I never succeeded in finding a corresponding gathering of females; never more than two or, at most, three, and these were feeding in quite thick woods.

After the Impeyan cocks had been feeding for a half-hour there arose a sudden excitement; several disappeared among the surrounding deodars, and all stopped feeding and stood listening and watching for several minutes. Then feeding began again, but in a desultory way, and one by one the birds left the glade until only two were left. I stretched my cramped limbs and in so doing slightly shook a branch, when both birds gave a single glance in my direction and launched out over the valley, uttering their screams of terror as they went. Thus ended my never-to-be-forgotten séance with the Impeyans at breakfast in their native mountains.

As regards the specific nature of the Impeyan's food, we find but little in literature. One author states that "in autumn the Impeyan feeds on a grub or maggot which it finds under the decayed leaves; at other times on roots, leaves, and young shoots of various shrubs and grasses, acorns, and other seeds and berries. In winter it often feeds in the wheat and barley fields, but does not touch the grain; roots and maggots seem to be its sole inducement for digging amongst it." West of native Garhwal, Impeyans have been observed feeding on edible mushrooms and round truffles, as large as the egg of a goose, which are known as *marewah.* Other records include wild strawberries and currants, the roots of ferns, and acorns. The few birds which I have examined were mostly shot in the early morning before they had had a chance to fill their crops. One had eaten several good-sized fragments of an elongated, very hard tuber; indeed, the edges of the upper mandible must perform an important function in cutting and splitting vegetable tissues of such firm consistency. Close to a digging ground of Impeyan Pheasants I once found a number of the hard elytra of a large species of beetle, indicating that the birds had devoured the bodies of these insects. When we consider the hundreds of these birds shot every year by sportsmen it seems a pity that no one has ever taken the trouble to examine the crops and so add to our exact knowledge of this splendid pheasant.

In winter, when the snow lies upon the ground, or when the Impeyans are low down among the oak forests, or, again, when their summer haunts lie within the fir zone, the birds roost at night up among the branches. Some dense clump of old trees may form a favourite perch, to which a number of birds will repair night after night. When such a place is known it is not difficult to hide and observe their approach, and more than once, just at dusk, I have stolen up beneath a chestnut and discovered the big round forms upon the branches overhead. All which I could see distinctly were cocks, but were roosting alone, each bird by itself, the social spirit being too lax to exact closer intimacy. Young birds perch, presumably, with their mother, as they are closely associated throughout the early stages of life, and may remain together until autumn or even early spring.

One observer told me of seven birds, all in female plumage, which in the autumn roosted regularly in a clump of rhododendrons, in three groups of two, two and three respectively, doubtless three hens and the young birds of the year.

When, however, the Impeyans make their summer home, as many do, at shrub line or even among the alpine meadows, many of their more usual habits become modified in accordance with their surroundings. The only note I can find on their sleeping habits in such places is that they "will often roost on the ground in some steep, rocky spot." Although I have searched very carefully I have never found Impeyans roosting thus, but there is no reason why they should not do so, as both blood partridge and snow cocks have a similar habit. Whenever I have studied Impeyans in open rocky country, both in Nepal and Garhwal, I have found that they invariably choose the protected—south or south-east—side of some steep cliff or outjutting mass of rugged boulders, and there roost in the niches well up on the precipitous face.

One such location I shall never forget. From the foot of the rock a meadow of coarse grass and dead lily stalks stretched steeply downward to a jumping-off place where a fault in the geological formation had cut a deep gash in the ground. Beyond this, the first valley stretched blue and mistily far down and across to the opposite mountain covered with dark and dense forest. Beyond lay three more mountain chains, their rolling curves intersecting, becoming more purple and ethereal as they stretched on into the distance. From the face of the cliff behind grew straggling graceful tufts of alpine grass, diminutive rhododendrons gnarled and rugged as the uppermost pinelets on Fuji. By climbing from crevice to crevice a few yards upward, a narrow shelf of rock not more than a foot wide, but winding for twenty feet along the cliff, was reached. It took but a glance to show that several birds had for some time made this their roosting place, and a number of feathers of a female or immature cock left no doubt as to the species.

But I wanted more proof, and so I began my afternoon watch on the flat top of a distant boulder—a huge, jagged affair as big as a dâk bungalow, wonderfully lichened and mossed, and eaten by frost and rain into a marvel of frescoing and deeper etching.

EASTERN HIMALAYAN HAUNT OF THE IMPEYAN

At the climax of three mountain ranges in eastern Nepal, a mighty boulder juts out from the steep slope. It is painted with lichens, encrusted with moss, and in a narrow shelf on its sheltered side a trio of Impeyans roosted. This roosting place, at an altitude above the limit of trees, was an isolated haven of safety, out of the reach of martens, foxes and wild dogs. The birds were crowded close together on the thick, soft cushion formed by the alpine moss, and above them there were the leaves of a tiny rhododendron which had found a foothold in a little crevice. Early in the morning, before the full sunlight would expose them to a passing eagle, the three would leap outward and scale down for their morning drink at a snow-fed torrent.

PHOTOGRAVURE PLATE 9

EASTERN HIMALAYAN HAUNT OF THE IMPEYAN

My battery of binoculars was soon mounted and I settled myself for a long vigil. A pair of lammergeiers came down to investigate, but sheered off after a keen scrutiny of their supposed prey. My only other visitor was a little creeper which hitched up and over the rock and mounted one of my hunting-boots before he realized that I was some fearful creature, not a part of the boulder, and dropped from view in voiceless terror over the rim of the precipice near by. My attention wandered from my main object, and when I again looked through my glasses I saw an Impeyan—a cock not yet in full plumage—squatted on the shelf. Soon two other apparently full-plumaged cocks flew up from the meadow, reaching the shelf with a single, direct, almost vertical flight from the ground. These birds moved scarcely a feather after they reached the shelf, squatting at once but with eyes wide open, and, until dusk obscured their forms, they showed no signs of sleep nor yet of movement. I slipped down from my perch and went back to camp. On the following night none came to the roost—at least until darkness put a stop to my watching, and on the succeeding evening the two cocks were alone. This was my last opportunity, and I was unable to learn whether the young bird would be seen again or not. I was especially sorry for this, as the next day a Nepalese shepherd passed me with a dead immature cock Impeyan which he had snared two valleys away. At this meeting he was suspicious of me, and I could not persuade him to sell me the bird. It seems hardly likely that this bird would have wandered a full five miles from its roosting place, so I have no doubt the birds were really two individuals.

The chief point of interest to me in this roost was the fact of the sound sense showed in choosing such a location. Beech martens and grey foxes were abundant and wild dogs were about, while doubtless other terrestrial carnivores of which we knew nothing were in the vicinity—all potentially impeyanivorous. But here, sheltered from all the worst storms, these birds had found a truly impregnable sleeping place. The darkness of night made all safe from soaring eagles, and the scant ten or fifteen feet of vertical rock between the ledge and the turf was a barrier which no four-footed foe might scale. But here again, most careful search failed to reveal the roosting place of any female Impeyans. Nesting was just about to commence.

Although Impeyans seem to tolerate one another's presence more or less throughout the year, I have never seen or heard of their associating closely with any other species of bird. They have often been found feeding in company with some of the Himalayan ungulates, and in certain places, especially in the western Himalayas, they prove a source of annoyance to sportsmen who are after tahr or goral. If the keen eyes of an old cock Impeyan once spy out the stalking hunter, the loud whistle of alarm is almost certain to arouse the suspicions of every tahr within earshot, and to make them restless and uneasy and almost impossible to approach. From the very first of my pheasant researches I had in my mind many possible inter-relations of interest—both friendly and inimical—which might exist between these birds and their neighbours, and in a number of species I found abundant reward in this particular respect for my many hours of observation, but with the Impeyans I failed to find any reciprocal associations such as that between certain kalij pheasants and small mammals.

As to the enemies of Impeyans we have more exact information. From the time when first womankind looked on the marvellous plumage of this bird and pronounced it superlatively necessary for the adornment of her apparel, man has outclassed all other enemies in the life of this pheasant. But just here we are concerned only with the natural foes of the species: creatures which have preyed upon it or from which it has escaped through all the centuries when mankind, far from thinking of personal ornament, was only too thankful to be able to preserve his own life from the wild beasts about him. So, ignoring for the moment the very recent arrival of the featherless biped—whose presence is so puny a phenomenon among the grandeur of the Himalayas, and yet whose tiny shiny weapon spells ultimate death and extermination for all these splendid creatures of the wilderness—let us picture the foes which, if they do not silence the downy chick striving to hide among the jungle, or if, indeed, they have not already crushed the life still within the egg, will surely cut short the proud magnificence of the overbold cock in his prime, or, certain as fate itself, take instant advantage of the first carelessness or weakness of old age.

My first experience with the Impeyan, as I have related, showed the golden eagle as one of these foes, and now that my study of the pheasant is completed, I return to eagles as perhaps the worst foes of this species. The love of the open shown by Impeyans, both old and young, gives these great wolves of the air many a chance, and too often the quivering balance of fate swings to their side. The Impeyans, both cocks and hens, are birds which, like the peafowl, choose to depend on their own eyesight for detection of danger, and when it is once perceived they seek safety by instant action and not by trusting to escape observation. I have never known, either in my own experience, or through that of hunters, of an adult Impeyan squatting for safety. The young will do this until strong on the wing. One glance dictates the course of action: a four-footed assailant sends the bird straight up into a tree; from a winged foe it bursts like a bomb from the ground and hurtles with incredible speed into the nearest cover. Whenever possible the aid of gravity is invoked, and the bird shoots down into the valley at as sharp an angle as the ground will permit.

Besides the golden eagle there are two others, Bonelli's and the spotted hawk-eagle, which unquestionably attack and kill Impeyans, while it is certain that the goshawk accounts for many a pheasant, both old and young.

As regards protective colouring in this species, the female, of course, is under all conditions less conspicuous than her consort. And it is most significant that she is not nearly as ready to take to wing as he, being on the whole much less wary, more willing to take a second glance at danger before flying; the chances of life have allowed her a wider margin of safety. The theory of counter shading receives a sad blow from the colouring of the cock Impeyan, he being jet black beneath, although living much in the open, and his white dorsal patch would seem for the express benefit of birds of prey, showing them just where to take the most effective grip—the broad back and thighs behind the beating wings. No, most decidedly, we cannot explain the Impeyan's armour by protection, and he seconds us in this opinion; he takes no chances by skulking or crouching. When the sun was hidden from view I have found the cock bird as inconspicuous at a distance as the hen, but when the first gleam broke forth it seemed like a searchlight falling upon his wondrous metallic plumage; every movement made of his body a living heliograph more potent than any scent or vocal utterance could possibly be to attract the attention of all, whether friend or foe. In the steamy, hot, dark jungles I many times admired the alert carriage and watchfulness of the pheasants dwelling there, but for no other bird did I ever feel the enthusiasm which the bravery, unconscious though it was, of the Impeyan aroused; apparently conscious of danger, clad in the most advertising of tints, and yet taking his chances in the open.

Lynx, leopards, foxes, wild dogs, beech martens, weasels, all doubtless look upon the Impeyan, awake or asleep, as their lawful prey. The recently slain body of the adult Impeyan of which I have written is the only tragedy of its kind within my personal experience, but several Himalayan sportsmen have commented upon the fact of finding, not uncommonly, a heap of scattered Impeyan feathers here and there on the hillsides with no trace of body or bones. These feather-revealed tragedies have been explained in an interesting way which certainly seems plausible for that period of the year between March and October. "All the larger eagles pair in February and March and begin building their nest very soon after, and from that time on till the young birds are fully fledged and able to follow their parents, all the game is brought to the nest daily, minus the feathers, which are plucked by the parent birds presumably where the bird was caught. I had an opportunity of watching the actions of a pair of spotted hawk-eagles only a short time ago, and finally sent up a man for the young one, which had only just begun getting a few of its back feathers. In the nest was a whole dove, with the exception of its feathers, a few, but very few feathers, of koklass and monaul, but any number of bones of all sorts and sizes. The young bird leaves the nest in August, but not to wander far from it, and does not accompany its parents till nearly the middle of September, when it gets its first training and is initiated into the mysteries of 'striking.' I have frequently seen the young birds getting a lesson. The mother soars into the heavens with her offspring following close behind and with a tender morsel in her talons. When sufficiently high to give the youngster a good fly, she drops it and lets him stoop after it, keeping near enough herself to catch it before it reaches the ground, in case the young one fails to get it. However, it is only one or two of the largest eagles that dare resort to this style of amusement, as any of the smaller ones attempting the experiment would soon have their breakfast snatched from them. It is from October to March that the absence of bones is hard to account for. Of course, during these months not many sportsmen visit the haunts of monaul and snow cock to notice, and even then, in the majority of cases, the eagles are usually followed by crows, who bother the life out of them as soon as they (the eagles) leave their perch. The keen eyes of the lammergeyer too are ever on the watch for scraps. Then again there are pine martens and foxes, neither of which would despise even the bones of a pheasant." The enemies of eggs and young I shall discuss elsewhere.

From Sikhim to Kashmir the nesting season of the Impeyan is in May and June. All the birds have now returned from lower levels, and at these high altitudes the spring of the year is at its full. The courtship takes place late in April or early in May, and, as in all the pheasants, consists in a display of the cock before the female, of such character that his brilliant hues and striking patterns are exhibited to the utmost advantage. Twice at a distance I observed Impeyans thus displaying, but in both cases my woodcraft was not equal to that of the birds, and before I could reach a position for careful watching they had taken alarm and disappeared. On the second occasion I consumed almost an hour in creeping a hundred yards, and was certain that neither by sight nor sound had I revealed my approach, but solace my pride as I might, the fact remained that the birds had left. From observations on captive birds I am inclined to think that the courtship is a rather more rapid affair than with many other pheasants. A cock will walk up to a hen, show off for a few seconds, and walk away again unconcernedly, in strong contrast to the ardour of a golden pheasant, who seems to take little time from his circlings and posing even to feed. Very much the same thing has been observed in a wild bird by Major Rodon, who, when shooting in Chamba one early April morning, noticed, as he was seated behind a tree, a pair of Impeyan Pheasants feeding a short distance away, on a flat terrace on the open hillside. He says: "they were so close that I was able to see their every movement distinctly. After being busily engaged some time in their usual digging operations, the hen bird stopped work and uttered her call note several times, upon which the cock, who was at the time some little distance away, ran up to her with his wings raised high above the back, tail spread, and neck and body feathers distended. He then moved quickly to and fro for a few seconds in front of the hen, who stood quietly looking on at his performance; he then abruptly closed his wings and tail, turned about and ran back to his feeding ground, while the hen went on with her breakfast. As the early morning sun was shining on the birds, the sudden appearance of the cock in the above performance was most splendid to look upon; the back and chestnut-coloured tail, spread like a fan behind, shone out most gorgeously. But it is not for the mere pleasure given by the exhibition that I write this note, but to direct attention to the unusual behaviour showed by the hen. As, I believe, in all courting displays among birds of fine-coloured plumage, the hen takes a most passive part, and does not in any way call the performance up; but the male birds themselves of their own accord go through the ceremony of showing off their fine feathers in front of their lady-loves. But in this case the lady-love, by her calls, appeared to have directly invited or encouraged the display, as the lover was digging out his breakfast until he heard the call sounded." The fact that the two birds were alone and apparently mated seems to me the principal point of interest, showing an extension of the courtship phenomenon or instinct beyond its logical season. Its incomplete performance doubtless reflected a dying-out of the wooing instinct.

Although I have several times watched a captive cock Impeyan displaying before the hen, I have never seen so elaborate a performance as has been recorded of a bird in England. In this case he "lowered both wings, stiffened the copper-red feathers on his neck to look like a small ruff, drew his bill under his chin so as to display his crest better, and then crept slowly round a grassy mound to look if the hen was observing him.

"Finding this to be the case, he crouched low on the ground, dropped his wings even further, and spread out his tail into a fan shape as far as it would go—which was a long way. He then suddenly raised his tail upwards and bristled up all his feathers, the head being lowered near the ground. He next lowered his tail, still keeping it spread out fan-shape, and commenced such a loud rattling and rustling of all his feathers (accompanied by a plaintive whistling) that I could scarcely believe it was the bird making so much noise. He then closed his feathers, except the tail (which he still spread to its utmost extent), and gave several froglike leaps forward in the direction of the hen, stopped short, jerked himself suddenly right-about-face, gave a flourish of his fan-tail in front of the hen, suddenly closed his tail, and then ran away." In this account the audible accompaniments, both instrumental and vocal, are of unusual interest, and probably represent the most extreme vital moment of the courtship. The effect of changed environment is shown by the fact that the exhibition took place on the tenth of January. There seems to be more latitude or unconscious individuality, if I may be permitted the term, among Impeyans in their display than in some others with more mechanical courtships. By this I mean that a certain cock bird will often slur over one detail and accentuate another, while on the whole following out the set scheme of display of his species.

The performance of one bird which I observed many times never varied, the invariable sequence being as follows. This cock approached the hen with long groping steps, describing wide circles about her, always with the inner wing lowered to such an extent that the feet and legs were completely hidden. The neck was extended and arched, swanlike, the crest thus standing quite erect, the beak pointing down. As he got nearer and more excited he pecked now and then at the ground, elaborately but meaninglessly. Gradually a more and more frontal position was assumed, and the tail began to be the most prominent feature, being raised to a vertical position and spread to its widest extent. At last the cock faced head on, with head and beak to the ground, wings spread, lifted forward and drooped, tail wide and erect, the bird bowing rhythmically forward and back. Finally the bird collapsed suddenly, stood up, settled his feathers, looked about for a moment as if he had awakened from sleep, and began feeding.

The display is essentially frontal; that is, while under the excitement of the season of courtship the bird may spread its wings or tail, or ruffle up its plumage as it approaches the hen, and especially on the side toward the demure disturber of his peace of mind; yet it is not until he is directly facing the hen that the real display takes place.

Summing up the courtship evolutions of the Impeyan, there seem to be several definite objects to be attained, although it must always be remembered that the action is wholly instinctive: The under parts and larger wing feathers are dull coloured and must be concealed from view; all the upper parts must be displayed to their utmost, but the copper and bronze-green of the neck and mantle are the *pièce de résistance* and hold the centre of display; the brilliant head and waving crest and the white dorsal patch must be in evidence, and, finally, the rich monochrome of the tail feathers forming the most admirable background in the world must needs be raised and spread out to their utmost. All this is achieved by the bird inverting itself as much as may be; bending far downward until its breast almost touches the ground, with the head and neck still erect, the back reared upward, and the tail spread to the fullest extent. The position is not unlike that of the peacock, and like that bird, but unlike the peacock pheasant, the wings are never brought forward, but kept at the sides of the body, and often only partially opened. The feathers of the back and wings are only slightly raised, but the mantle and neck plumage fluff out into a radiating halo of most marvellous beauty, encircling the head and vibrating crest. Words totally fail to convey the glory of an Impeyan at this his supreme moment of life. For this he wears his flaming armour throughout the year, inviting constant attack and death. One cannot help getting thoroughly out of patience with the hens, who gaze at the efforts of their gorgeous suitor with less enthusiasm than they manifest in searching for the next grub! We humans stand transfixed by the beauty, longing for more real insight into the minds of these little mountain folk; striving for some clue as to how it all came about and exactly what it all means. How willingly would I seize upon the least hint of conscious appreciation; how ready I stand waiting to exaggerate anything which I could interpret as akin to our human æsthetic sense; but the most ardent lover of birds, if he is perfectly frank with himself, must acknowledge that birds seem almost to lack this faculty. I have seen an Impeyan which by accident had lost its tail, raise and spread the coverts with as great *éclat* as though his splendid orange fan was perfect. I believe if his plumage was dyed the most ugly colour in the world, the ardour of his courtship would abate not one whit. There seems considerable reason to believe that such a transformation would affect the hen, but that her æsthetic sensibilities would be hurt I cannot believe!

The inconspicuous mottled cloak which Nature has wrapped about the female Impeyan is essential for the month of incubation—that critical four weeks of her annual life which must be lived in one spot. Think what a fearful handicap such a period must be; the bird, active and vigorous, able to watch for danger on tiptoe or from a tree, to flee from it on foot or wing, suddenly becoming a static creature, voluntarily assuming the rôle of a plant or stone, and even though she save her life at the very last gasp, her eggs—as helpless as pebbles—lie ready for the maw of any passing foe. If within the short period of my stay in the Himalayas, with the dulled senses of a human being, I was able to discover three nests, how much more fatal must be the daily wanderings and nocturnal pryings of the keen-nosed creatures of the forest!

The sun shone warmly down upon me as I lay one day on the fallen needles of a great coniferous forest in the western Himalayas. It was the middle of May, perhaps the most delightful time of the whole year. I had passed from the furnace heat of the Indian plains, up through the barren, euphorbia-dotted lower zones, and after many days' travel had reached these cool, upper forests over a mile and a half above the sea. I sat at the edge of a narrow ravine, from which tall spruces and deodars rose straight as plumb-lines high above the surrounding slopes. The sun shone fitfully; now the full warm glow lighted up the varying shades of green, and every needle was still. Crested tits called, brilliant minivets dashed about among the highest branches. Then a cloud passed, and a chill wind swept down from the snows, soughing through the needles like the sound of continuous heavy surf. The holly-leaved oaks bent and swayed, each twig tipped with the warm maroon of the young leaves. With each gust a shower of tiny, brown, tissue-paper scales fell around me, each the liberty-cap of a new deodar shoot. The branches were dotted with myriads of the pale green, velvety brushes of new-born needles, while as many more were still striving to be free from the split, pointed sheath-caps. Little insects love these fresh growths, and delight to eat into their hearts and blight the hopes of a new Himalayan twiglet. Thus in turn is explained the eagerness of the exploring flocks of tits and warblers. All were not in flocks, however, for one little crested black tit did not swallow the spiders and grubs, but filled her beak with them and flew straight to a tiny hole in the great four-foot bole of a mighty spruce. The heart of the splendid tree, which had braved the gales from the distant snows for centuries, held safe her secret—a half-dozen caricatures of birds—atoms of fluffy down—who waited so patiently in the darkness for the coming food, the never-failing beakfuls of insects which would enable them soon to explore the great forests for themselves. Many a withering brush of needles was freed from its insect blight by these tiny foragers, and the thought came, if they and all their feathered kindred should die or disappear, how soon would the ancient spruce and all its fellows stand stark and bare—awaiting death; succumbing surely to the insect hordes, which nothing but the tireless energy of the bird world keeps in abeyance!

Nutcrackers called and hammered loudly; black and yellow grosbeaks shrieked their *Che-che-ult!* and from a distant valley came the five-syllabled crow of a koklass pheasant. But my eyes continued to follow the little tit as she made trip after trip to the home in the spruce. Once she gleaned from the low shrubs, and was flitting about near the ground when I heard her utter a sudden scolding note and pause in her search. She concentrated her attention on a tangle of ivy, and had discovered, as I supposed, a snake or other animal, which the little bird considered as worthy of her contempt. She gave it but a second glance, however, and returned quietly to her caterpillar hunt. I carefully focused my glasses on the spot, and almost at the first scrutiny made out the head of some large bird through the interstices of the leaves.

The bright eye seemed to be fixed upon me, so I made no sudden movement, rising quietly and walking slowly away, but down the slope, in order to get a better view. Finding this impossible, I climbed some distance up a half-dead spruce, and had an almost clear view of a female Impeyan sitting close to the base of a rotten stub, half buried in a mass of Himalayan ivy and maidenhair fern. Her mottled plumage merged insensibly into the dry leaves; her pale-blue eye-space might pass for some lowly blossom. It was indeed a red-letter day! How I sat and looked, and looked again! The whole landscape seemed changed; all was a mere setting for this gem; mere accessories to complete the picture. The forest itself became the *place where* the Impeyan nested. The little tit flew to and fro unheeded, unwatched. My interest became concentrated on the floor of the forest—where *she* sat, and where *she* must, somehow, mysteriously leave her treasure and search—how hungrily, and yet begrudgingly—for food.

But even aside from this, to me, wonderful discovery, the forest carpet was a thing of marvellous beauty and great interest. In more open parts, where oaks prevailed, grew low jungles of roses and gracefully sweeping, pink-flowered raspberries; or where the deep shade of the deodars held sway were the flowers of the shadows, growing singly or in friendly groups of several—lilies-of-the-valley, Solomon's seal, or so they appeared to American eyes. Here too, in the very presence of the wonderful wilderness home, were banks of delicate maidenhair fern, all in deep shadow, a filmy tracery bending to breaths of air which I could not sense. And wherever the ferns failed, crept the ivy, winding its dull-green trail over fallen trunks, or seeking to hide every stump or half-dead tree.

In such a fairyland I found my first home of the Impeyan; under such conditions the little lives begin their growth. It was a new thought to imagine the wonderful iridescent creatures of the high rocky meadows as starting life here amid the dim light beneath the ferns.

The mother bird moved not a muscle—she seemed scarcely to wink—while I watched her that day, and on the following she remained equally quiet, although once I walked within twenty feet. The succeeding day, at nine in the morning, she was not to be seen, and I hastened to take photographs of the two large, thickly speckled eggs, and retreat before she returned. In the afternoon she had returned, but on the fourth day came tragedy swift and final. As I came along the slope I heard the familiar crash and roar of a troop of langur monkeys. I approached, and the noise lessened until the forest was still, but as I came over the ridge a long-tailed grey form leaped from the undergrowth up a bare, half-fallen tree trunk, and ran along it on three legs, holding something clutched in one hand. I suspected something was wrong and ran headlong at the great monkey, who promptly dropped the object and fled from tree to tree, swearing roundly at me the while. A glance at the nest showed it to be empty, and several minutes' search beneath the dead tree revealed one of the eggs, with a great gaping hole in one side, through which the yolk still dripped. The female was never seen again, but the very same day another nest, identified by tell-tale feathers, was found under the shelter of a small moss-covered boulder not more than two hundred feet away. The second female was not observed either upon or near the nest.

As enemies of the Impeyan, the langurs at once assumed a new interest in my eyes. The troop fled overhead into the thicker parts of the forest, making an almost incredible racket. Tree after tree shook and bent as in a terrific gale of wind, branches crashed and splintered, cones, needles and oak leaves rained to the ground as the band swung and leaped past. Rarely they dropped to the ground, galloped for a few steps and swung up again, but even among the narrow, cone-shaped firs it was seldom that there was a break in their aerial path. Their pale buff bodies and black faces formed a strange colour note among the conifers, and their low chatter merged with the great noise of their passage.

Strange to say, this not unusual uproar in the deodar forests does not unduly startle the other lesser wild creatures, but the small birds and mammals hate them with a well-deserved hatred. They well know the four-handed folk, their limitations and their dangers. I saw langurs mobbed by nutcrackers and other birds more than once, and a squirrel never lost a chance to tell the marauders what he thought of them. Doubtless many a score of pheasants and birds of lesser size are robbed of their eggs by these keen-eyed animals. But they do not have it all their own way. One day my shikari led me to some splintered bones and tufts of hair, which revealed where one of these monkeys had fallen prey to some leopard or other carnivore. Sometimes the peace of the sweet-scented mountain forests and the songs of the birds seemed but hollow mockeries as I thought of tragedy moving swiftly, first here, then there, claiming—first or last—every creature, insect, bird or mammal.

In connection with the two nests of Impeyans which I found in quite close proximity, it is interesting to read that one observer has written, "in localities where they are very numerous . . . several nests may be found within a circle of a hundred yards, as if the females were, even at this season, more or less gregarious."

The two nests which I have recorded, and a third found later, were all alike in that there was no nest in the usual sense of the word. The eggs were deposited

PHOTOGRAVURE 10

WESTERN HIMALAYAN HOME OF THE IMPEYAN

Two miles above the sea, in the coniferous forests of Garhwal.

Between a jagged bit of rock and a sturdy deodar, I crouched early in the morning, every needle and leaf about me drenched with dew. Behind were six ranges of mountains, dropping away from the fathomless valley at my feet, and yet rising ever higher and higher to the distant Tibetan snows.

Before me was a glade surrounded by small trees, and having the appearance of recent ploughing or of thorough trampling by the hoofs of a great herd of cattle. This was a feeding ground of cock Impeyans, and within an hour on this particular morning fourteen full-plumaged birds appeared. Wielding their beaks like picks, they dug deep holes and overturned clumps of turf in their eager search for grubs and succulent tubers. Probably each had a mate somewhere in the surrounding forests brooding her eggs, but each morning these birds, too gaudy to dare to approach their nests, came here for a social meal, then separated to feed alone during the remainder of the day.

WESTERN HIMALAYAN HOME OF THE IMPEYAN

in a depression that might have been made by the mere weight of the bird. The dead leaves and flower stalks which lined this were only those which the "accident of fate" had already deposited there, but in each were a half-dozen or more soft breast feathers of the hen Impeyan. One nest was close to the foot of a decayed stub, another fairly touching an overhanging boulder, and the third near a living oak-tree. Two were at an elevation of eight, the third nearer nine thousand feet. Other nests are described as being found under the shelter of an overhanging rock, the massive root of a large tree, some thick tuft of fern or grass or near a fallen trunk, the hollow being either bare or with a natural lining of dry grass, leaves or moss.

The two eggs which I found were evidently a set, as the broken one showed signs of about a week's incubation. Natives tell of sets of a dozen eggs, and one record states that nine were found, but it may have been that these were eggs of the koklass. Eight is the largest perfectly authenticated number, and the usual quota is unquestionably four or five. Sets of two are by no means unknown

The eggs of the Impeyan Pheasant resemble those of our American wild turkey so closely that some specimens are almost indistinguishable. The most persistent difference is that the eggs of the turkey are slightly broader and more pointed. Comparison of the females of the two species and their eggs is of interest, considering the various characters of the turkey as 1.

	Body Measurements.	Body Weight.	Size of Egg.	Number of Eggs.	Period of Incubation.
♀ Turkey . . .	1	1	1	1	1
♀ Impeyan . . .	⅔	½	1	⅓	1

The eggs of the Impeyan have a firm and compact shell, with but slight gloss, and in shape are broad, rather blunt ovals. The ground colour is creamy or buffy white, the entire surface thickly freckled with dark reddish brown. These markings show considerable variation; rarely almost absent; more frequently in the form of minute pore-like specks, or most commonly with a large number of spots about one-twentieth of an inch in diameter. Again, we find more rarely large irregular blotchings. Sometimes the markings are more dense in the centre, in other specimens at one or the other end.

One egg from the eastern Himalayas is of a pale white ground colour, glossy and faintly pitted. It is much rubbed, but on the unrubbed portions the ground surface is concealed by a fine, even freckling of dark sepia, with many larger centres, irregularly scattered, but about 2 mm. apart. A second egg is slightly darker, with darker, less abundant markings, which, however, are individually larger, with more of a blotchy character, thickest about the small end.

A set of four from Garhwal is quite different. The ground colour is rich cream, deeply pitted, and blotched with ochre. The larger blotches are glossed with very evanescent translucent white, producing a peach-bloom effect which rubs off easily. In two the blotches are confined to the middle third, another has them at the large end, and the fourth shows them distributed evenly over the entire surface.

They measure from 43 to 48 mm. in breadth, and from 61 to 68·5 in length; averaging 45·5 by 65 mm.

As to the more intimate wild home life of the Impeyan, we can only piece together the fragments of observation which are all we have. In captivity we know that occasionally the cock will assist materially with the care of the young birds. I know, however, of no instance of his approaching the nest or eggs during incubation. Doubtless, in a wild state, swift destruction would follow in the wake of his conspicuous figure did he haunt the vicinity of his sitting mate. In spite of several vague assertions and some little apparent evidence, I believe that the Impeyan is but seldom polygamous, and that the birds usually pair off soon after the period of courtship.

We read that "it may be questioned whether they do pair or not in places where they are at all numerous ; if they do, it would appear that the union is dissolved as soon as the female begins to sit, for the male seems to pay no attention whatever to her whilst sitting, or to the young brood when hatched, and is seldom found with them." The final rather ambiguous statement is cleared up, and the cock is freed from the slander in the first line, by the fact that in many, and probably most cases, he does rejoin his family when their safety from the dangers of nest and early chickhood is assured. In summer and early fall the parents and young live and roost together, remaining more in the shade of the forests than on the open hillsides.

The vicissitudes of chickhood are shown by the average number of two young birds seen with the mother in the autumn and winter, often only a single one remaining out of the average of five or six which must have been hatched a few months before.

However numerous their enemies, it is difficult to believe that the lammergeier is to be included among them. It has been stated that the bearded vulture destroys the adult birds, but this vulture would hardly be found within the forest itself, and we have no first-hand observation of its attacking pheasants, either old or young.

We know that the Impeyan cocks are seen again and again with their partly grown broods, but it is only in captivity that we can hope to gain such insight into their admirable family qualities as is recorded of a pair of birds which reared their young year after year in an enclosure some thirty yards square. The young birds began to perch when three or four weeks old, and it was a charming sight to see them settling down for the night, perched between the parents, both of which extended one wing over the nearest chick, for the cock bird took his full share of night duty. One has only to close one's eyes and think of the forests of mighty deodars and firs, the air of the cool Kashmir summer night, heavy with spicy resinous odours, to feel a mighty affection for similar little families perched asleep among the branches—all too few left alive to-day.

Here we have a rather complex yearly cycle of life ; the two sexes in loose flocks ascending in spring to their breeding haunts ; pairing and a brief association ; the segregation of the males in flocks during incubation, and in the summer a reuniting of the families, the attraction this time being apparently pure family affection—a fact which, if true, goes far to compensate for the dashing of our belief in their æsthetic appreciation ! Then, finally in the fall, the bond loosens, and the male again drifts apart from his mate and young, who soon begin to wander down the mountain slopes to their winter haunts in the valleys.

RELATION TO MAN

A bird of so striking an appearance as the Impeyan Pheasant could not fail to impress strongly the human inhabitants of its native haunts. The most pleasant phase of all its relations with mankind is the legends and stories which have arisen in connection with its habits or its wonderful plumage. One, which belies the apparent stupidity of this bird, tells how the Kalchuniya and the Monal or Impeyan disputed for many, many hundreds of years as to what time the sun rose. The Kalchuniya, who lived in deep, dark valleys, said the sun appeared first upon the lower hills, while the Monal, on the contrary, claimed that it shone first on the highest mountains. Now these two birds were the earliest risers of all in this region, and they would entrust the settling of the dispute to no one, so they agreed to keep watch on a certain night, and whoever first saw the sun should inform the other and announce his victory. The Kalchuniya flew off, and was soon lost among the dark foliage of the lower hills, where he perched and began his long night's vigil. The Monal, as was his custom, flew upward and perched for the night upon a lofty summit, ruffled his plumage, placed his head between his wings and slept. The night passed, and at earliest dawn the first rays of the morning sun awakened the Monal, who at once flew far down into the valley which was still wrapped in darkness, where he found his friend the Kalchuniya in deep slumber. The Monal awoke his rival, and won. It will be observed even to-day that the Kalchuniya does not run like other birds, but hops as if it had lost its feet, showing that when the Monal awoke it, hundreds of years ago, it received some injury. The moral of this tale is as plain as it is uncommendable; the victory of the crafty sluggard over his zealous but scatter-brained rival.

To the millinery hunter, what the egret is to America, and the bird of paradise to New Guinea, the Impeyan Pheasant is to India—the most coveted of all plumages. There is a great tendency to blame the native hunter for the decrease of this and other pheasants, and from what I have personally seen in many parts of the Himalayas there is no question but that the Garhwalese and Nepalese hillman has wrought havoc among the birds, but he is by no means the sole cause. As long ago as 1879 we read that "The great demand for the brilliant skins of the Moonal that has existed for many years has led to their almost total extermination in some parts of the hills, as the native shikaris shoot and snare for the pot as well as for skins, and kill as many females as males. On the other hand, though for nearly thirty years my friend Mr. Wilson has yearly sent home from 1,000 to 1,500 skins of this species and the Tragopan, there are still in the woods whence they were obtained as many as, if not more than, when he first entered them, simply because he has rigidly preserved females and nests, and (as amongst English Pheasants) one cock suffices for several hens." Ignoring the uncertainty of the last statement, it is rather absurd to think of a single man "preserving" females and nests in the Himalayas in the years 1850 to 1880, when the British Government, despite most efficient laws and worthy efforts, is unable to protect the birds of these wild regions to-day. The statement that after thirty to forty-five thousand cock Impeyans were shot or snared, as many or more than the original quota remained could only emanate from the mind of a professional feather hunter, and Hume should not be blamed for more than the mere repetition of such figures. Let it be said to the credit of Wilson, the said slaughterer of something under forty-five thousand Impeyans, that he was a careful observer of the birds' habits, and has given us an excellent account, somewhat coloured by natives, but on the whole the best we have had in the past. But it is not pleasant to read of his waiting until "twenty or thirty have got up and alighted in the surrounding trees and have then walked up to the different trees and fired at those I wished to procure without alarming the rest, only those very close to the one fired at being disturbed at each report."

Hume's personal opinion, that in 1879 there were scores of places where one might secure from ten to eighteen birds in a day, is certainly not true to-day. Indeed as early as 1858 we read that "This splendid bird, once so abundant on the western Himalayas, is now far from being so, in consequence of the numbers killed by sportsmen on account of its beauty; whole tracts of mountain forest once frequented by the Monal are now almost without a single specimen." The same author goes on naïvely to tell the reader that "Among the most pleasant reminiscences of bygone days is a period of eleven days, spent by the author and a friend on the Choor Mountain, near Simla, when among other trophies were numbered sixty-eight Monal Pheasants," etc.

For some unaccountable reason there is, or was for many years, a very prevalent idea that the enormous number of skins which have poured into the London market were from birds bred in the vicinity of Calcutta. When we remember the intense heat of that low-lying city and learn from the records of the Calcutta Zoological Garden that Impeyans and tragopans are even shorter lived than in Europe, the absurdity of the idea is apparent. In spite of numberless inquiries throughout India, I failed to learn of a single young bird ever hatched even in the high, cool hill-stations. The commercial value of an Impeyan skin varied from five dollars to twenty dollars, according to the number received annually. In 1876 an estimate placed the monthly average of Impeyans received in London at from two to eight hundred.

As regards the status of the Impeyan in later years, we read that at one feather sale in London, in 1904, six hundred and forty-eight Impeyan skins were sold, while an Indian ornithologist makes the statement that, thanks to the action of the Government, no Indian species except, possibly, the Monaul Pheasant seems in danger of early extinction. But, however rare it is at present, complete extinction is not yet to be feared, owing to its wide range and the inaccessibility of some of its varied haunts.

As regards the flesh of the Impeyan we find many differing accounts. One writer finds the birds in May not very good eating, nothing equal to the English pheasant or cheer or koklass. Another says the flesh is bitter and inedible, a third writes of the excellence of young birds, and a fourth that a cock was "as tough as an old shoe." My experience was that of the first mentioned. There seems no doubt that the flesh varies with the season, influenced by the food—a change from some ground tuber to acorns doubtless resulting in an entirely different flavour of the flesh. Natives are of one opinion on the subject, judging by their readiness to eat Impeyans of all ages and at any time of year.

The methods of trapping are chiefly two: first, the low bamboo fence with frequent openings in which are suspended nooses, and the more primitive but often even more effective plan of simply staking out scores of yak-hair nooses over the digging grounds of these birds.

In regard to the enemies of the Impeyan in the western part of its range we read that "last, but by no means least, comes the curse of the Himalayas, viz. the 'pahary' with his snares. One frequently finds four or five consecutive spurs lined with nooses from top to bottom, chiefly set for musk deer, but birds by no means come amiss and keep the men in food till a few unfortunate musk deer also fall victims. I have taken the greatest delight, on several occasions, in cutting every noose, and have gone up and down the spurs from end to end especially for the purpose, thereby demolishing in one day what has taken two to four men a couple of weeks' hard work to put up." This righteous fervour of anger against the native hunter is somewhat discounted by the many inexcusably large bags taken by thoughtless, selfish sportsmen, but the majority of British sportsmen in India are fortunately deserving of their title, and, no matter what the temptation, take thought both of the status of the wild creatures and of the next sportsman to come that way, and do not limit their bag by the capacity of their cartridge pouches.

I never heard a native accuse the Impeyan of taking his wheat or barley, and I believe the statement to be true that even when they were more abundant, their toll from native fields in winter consisted almost altogether of insect food and not grain.

CAPTIVITY

The history of the Impeyan Pheasant in captivity is a close parallel to that of the tragopans. The praises of this species, on account of its incomparable metallic plumage, and the glories of the "Golden Bird," of "le Lophophore resplendissant," were sung throughout Europe. ". . . Ce magnifique oiseau que les Indiens, dans leur admiration, ont surnomme *l'oiseau d'or*, qu'ils auraient appelé plus justement l'oiseau d'émeraude et de saphir. En effet, l'éclat de ces pierreries brille sur le plumage du mâle, mêlé à des tons pourpres lustrés, violets pourprés, bleus métalliques, noir corbeau, et font de cet admirable gallinacé une véritable merveille, ornée de toutes les splendeurs que la main de Dieu a prodiguées aux oiseaux de l'Himalaya. Sans nul doute, il serait le roi des airs, si la royauté appartenait à l'éclat, à la magnificence du plumage." Then, when the first eggs were laid and chicks hatched, seemingly strong and vigorous, prophets arose, and one reads how the copses of England, the *wälder* of Germany and *les forêts* of France were to be made the home of this splendid Pheasant of Pheasants. To-day, after years and decades of the most painstaking efforts, we must admit almost complete failure as regards any actual acclimatization. If given suitably roomy and secluded quarters a pair of Impeyans may breed, and even rear their own young to maturity, but should any little factor go wrong, should the temperature, humidity, food, vary ever so slightly from the requirements of the young birds, they die at once. And after all these years of experimenting we have not succeeded in finding out what the necessary factors are, or at least they are so loosely defined that the successful rearing of these birds is hazardous in the extreme. No more success has attended the efforts of enthusiastic lovers of these birds in establishing them on estates where considerable stretches of mountainous country somewhat reproduce their native Himalayas. It is hardly possible that the Impeyan can long survive its feral extermination.

The very specimens from which the species was named and described were kept for some time in captivity in India, but died on the voyage when Lady Impey attempted to bring them to England.

The first mention of these birds laying and hatching in captivity is in the years 1854 and 1856, and from this period onward we find the two chief sources of experimentation to be the London Zoological Gardens and the Jardin d'Acclimatation. Looking back on the results of the subsequent fifty years, we find that remarkably painstaking care was exercised to bring about success both by English and French aviculturists. It is from the latter, however, that we learn by far the most, for while we read much about Impeyans being "bred" in England, we find that this means in many instances only hatched. Again, the Frenchmen give us many valuable details of their failures as well as successes, while English failures are marked only by the absence of the bird's name from the indices of their publications.

The results of the first extended attempt at breeding by the London Zoological Society may well excuse the high hopes aroused for future acclimatization. Of the Impeyan and four other species of pheasants we read that "in 1858 the five species above mentioned produced 184 eggs, from which no less than 120 birds were hatched, and 111 reared. These were, for the most part, disposed of by sale to various members of the Society having facilities for continuing the experiment." Here we are told definitely of the rearing, but nothing of the percentage of each species, whether eleven or one hundred Impeyans were brought to maturity.

Nothing appears to have been published by the purchasers of the above birds, and, although between the years 1848 and 1868 there are recorded thirty-three instances of the Impeyan "breeding" in the London Zoological Gardens, yet the collapse of this pheasant's "boom" was almost complete. At the end of 1878 it is admitted that a number of the Indian pheasants early imported in such numbers had become almost extinct in Europe. "The Impeyan has not bred with us since 1871, and has, I believe, likewise failed on the Continent." In France we read of such experiences as when one enthusiast purchased four Impeyans for seven hundred dollars, and in two years of most careful endeavour obtained only five young birds, which died one after the other, although one reached the adult stage, so we do not wonder that he is moved to add that "Ces échecs me dégoûtèrent des Lophophores!"

I have taken up this phase of the Impeyan's history in such detail with the deliberate intention of emphasizing the importance of protecting the wild birds which remain in all the regions where Caucasian laws carry weight.

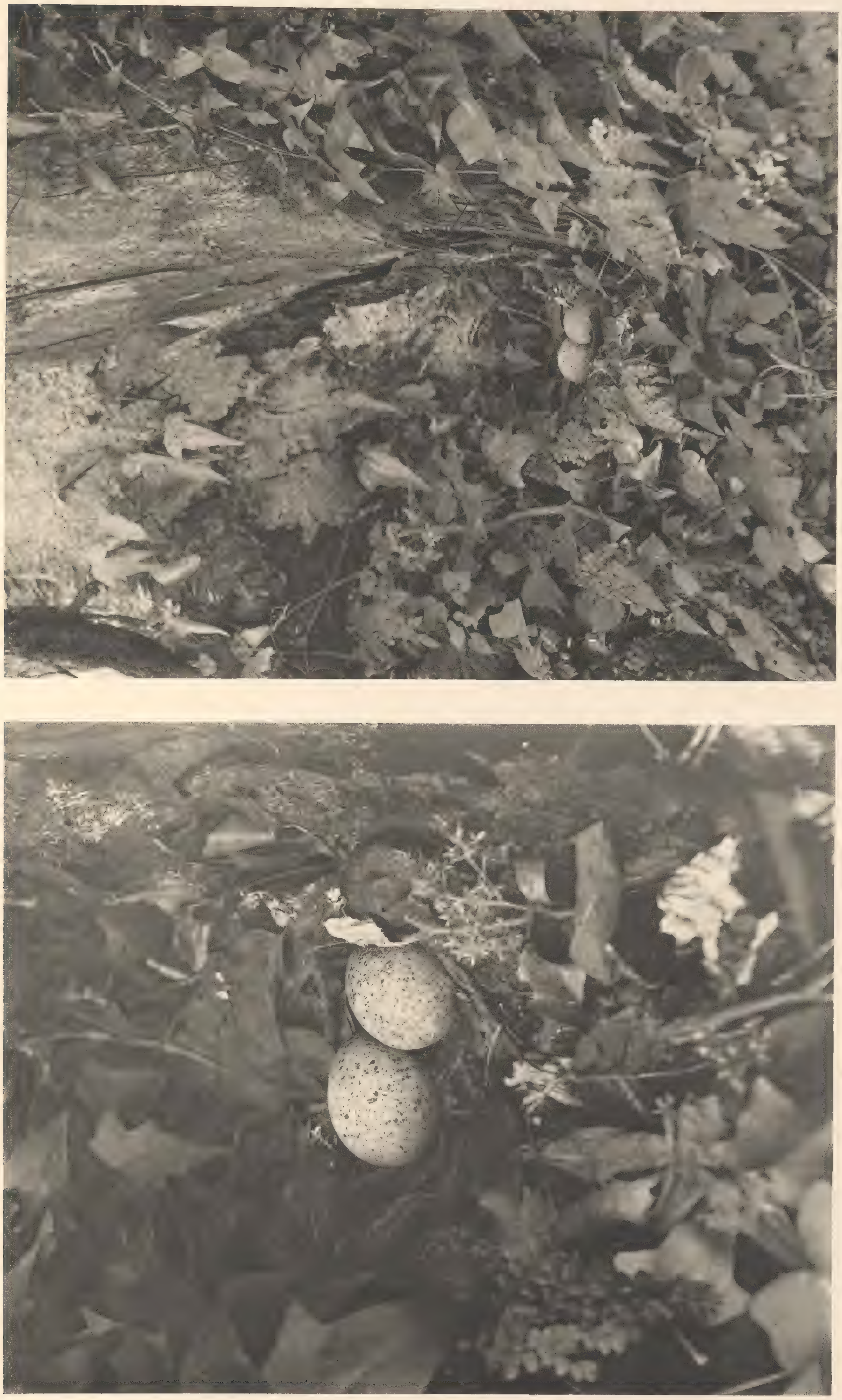
In captivity Impeyans in general may begin to lay as early as the second or third week in April, and the eggs are deposited three or four days apart. A careful reckoning of several scores of individual layings shows the average number to be about the same as among wild birds. There seems to be more or less individuality in regard to the size of the set, as a hen which has deposited six eggs or eight eggs early in the season, will occasionally again produce a similar number if the first are taken away. The period of incubation is from twenty-six to twenty-eight days.

PHOTOGRAVURE II

NEST AND EGGS OF THE IMPEYAN

At the base of an ancient, weather-beaten stub, half hidden in a mass of Himalayan ivy and maidenhair fern, a hen Impeyan had made her nest. She would never have been revealed had not a crested tit discovered and scolded her. In the cool air of these high Garhwalese forests, I watched the bird day after day. During her brief absence, I photographed the two great spotted eggs. The succeeding day I surprised a group of bander-log—the great grey Langur monkeys—and one of them had stolen the spotted eggs and was climbing up a slanting tree-trunk. The lives of the two young Impeyans were thus snuffed out; the spring courtship, the battles of the cock, the care on the part of the patient mother, all had been of no avail.

PHOTOGRAVURE PLATE 11



NEST AND EGGS OF THE IMPEYAN

The nesting site is usually the ground under some shrub or tree, the hen sometimes scratching a hollow, and sometimes collecting a scanty lining of straws or grass. Occasionally the eggs are deposited on an elevated shelf or box, but I can find no reason for the broad statement that the hens, like the tragopans, usually lay their eggs in elevated boxes and artificial nests in shrubs.

As regards food for the chicks, one successful breeder advises ants' eggs, bread-crumbs, hard-boiled egg, wheat, buckwheat and millet, berries and soft insects.

A régime which I have found as satisfactory as any consists of a mash of hard-boiled eggs, lettuce, bread-crumbs and crushed hemp seed, given fresh three or four times a day, all traces of the previous meal being removed; several daily supplies of ants' eggs and meal-worms, as well as cut-up raw onions and apples, are given. Later, maggots cleansed in bran are valuable. By far the most important items are worms and insects, and especially when the young birds have the opportunity to dig these for themselves. The best results have been attained where the young have been allowed to roam all day at will over a large uncut enclosure, or to dig with their beaks among the vegetables in a garden, the latter experiment resulting in plump, healthy young Impeyans, but no vegetables! It must be remembered that these birds are fitted for a life of digging, and if we consider the possible subterranean food supply, we will realize that worms, grubs and other insects, raw vegetables, such as lettuce, onions, potatoes and apples, will more closely approximate the food thus obtained in the Himalayas than the ordinary grain diet upon which other groups of pheasants thrive. Wheat and barley are the best grains for Impeyans; corn is the worst.

Stale food or uncleansed maggots will make short work of young Impeyans, and, in some cases, a single meal of such improper food has been known to destroy an entire brood of strong three-months-old birds.

If we may judge from his reports, H. Flocard of Rocroi, France, has had remarkable success in breeding and rearing Impeyans, and I have translated the more interesting parts of an account written recently by him.

The lophophore resplendissant does not suffer from our climate even in the colder portions of France, where I have bred them for forty years (Rocroi, N.E. France, *circa* 50° N. Lat.). The laying of eggs commences during the first part of April, or sometimes on the last days of March. By using careful judgment one may, little by little, accustom a cock to the care of two hens. The birds can live and reproduce up to an age of twenty-five or even thirty years. This may appear to be an exaggeration, but I have proved it. The food of the adult is much like that of the other pheasants: corn, wheat, buckwheat, and much green stuff. In winter the green food may be replaced by the roots of wild endives and dandelions, or carrots cut up into pieces.

From March 15th to June 15th stimulating food is required, and it is best to feed twice daily bread-crumbs and hard-boiled eggs, a single egg to a pair of birds, or two if there be an extra hen. A larger amount of this egg food will prove injurious, and soon the birds will refuse even this small quantity. A conifer should be placed in the aviary, a fir, arbor vitae or yew, at the base of which an excavation should be made containing an artificial egg. Here the hens will lay.

The eggs should not be allowed to remain long in the nest for fear of injury. They should be placed in an uncovered box, in a bed of wheat or other grain, in a place rather damp than dry. The hen will lay about six eggs, at intervals of two, three, four, or even five days. When the set is completed it will be noticed that she will spend the night upon the nest. Both the artificial egg and any of the Impeyan which may be in the nest should now be removed, and the nest hollow completely covered for a period of about twelve days. Then by uncovering and replacing the artificial egg, the second laying may be induced, and in a similar fashion even a third set of eggs. By this procedure twelve to fifteen eggs can be obtained each year from each lophophore hen. After June 15th no more eggs may be expected.

The eggs are to be placed under a brooding hen, the time of incubation being twenty-seven days, and not thirty as many authors state. The hen should be shut up with her chicks for several days and then liberated in the aviary. Hard-boiled eggs, bread-crumbs and ants' eggs should be provided for the young birds. It is well to provide quantities of living larvae of ants and other insects. The drinking water should be boiled until the birds are three months old.

TEXT IDENTIFICATIONS

Page	Line	
113	3	Hume, Game-birds of India, I. p. 125.
113	7	Macintyre, Hindu-Koh, p. 83.
114	21	Sikhim Coal Tit, *Lophophanes beavani* Blyth.
114	21	Himalayan Brown Tit, *Lophophanes dichrous* (Hodgson).
114	22	Rufous Pied Woodpeckers, *Hypopicus hyperythrus* (Vigors).
114	28	Black-throated Thrushes, *Merula atrigularis* (Temminck).
114	30	White-collared Thrush, *Merula albicincta* (Royle).
114	43	Spotted Dove, *Turtur suratensis* (Gmelin).
114	45	Golden Eagle, *Aquila chrysaëtus* (Linnaeus).
115	2	Cat-bear, *Aelurus fulgens* Cuvier.
115	19	Wardlaw-Ramsay, Ibis, 1880, p. 70.
115	20	Hume, Game-birds of India, I. p. 130.
115	21	Snow Cocks, *Tetraogallus.*
116	40	Wilson, in Hume's Game-birds of India, I. p. 128.
121	40	Adams, Proc. Zool. Soc., 1858, p. 500.
121	41	Tyler, Ibis, 1868, p. 194.
123	3	Himalayan Creeper, *Certhia discolor* Blyth.
123	23	Beech Marten, *Mustela foina* Erxleben.
123	23	Grey Fox, *Vulpes alopex* (Linnaeus).
123	24	Wild Dog, *Cyon javanicus dukhumensis* Sykes.
124	14	Golden Eagle, *Aquila chrysaëtus* (Linnaeus).
124	28	Bonelli's Eagle, *Hieraëtus fasciatus* (Vieillot).
124	28	Spotted Hawk-Eagle, *Spizaëtus nepalensis* (Hodgson).
124	30	Goshawk, *Astur palumbarius* (Linnaeus).
124	35	Thayer, Auk, 1896, p. 124.
125	10	Rodon, Jour. Bombay Nat. His. Soc., XIII. p. 185.
125	12	Donald, Jour. Bombay Nat. His. Soc., XIV. p. 174.
126	10	Rodon, Jour. Bombay Nat. His. Soc., XII. p. 573.
126	37	Smith, Avicultural Magazine, N.S. VII. p. 160.
128	43	Crested Black Tit, *Periparus melanolophus* (Vigors).
128	9	Himalayan Nutcracker, *Nucifraga hemispila* Vigors.
128	9	Black and Yellow Grosbeaks, *Pycnorhamphus icteroides* (Vigors).
130	7	Langur Monkeys, *Semnopithecus entellus* (Dufresne).
130	40	Hume, Game-birds of India, I. p. 131.
132	29	St. Quintin, Avicultural Magazine (3), III. p. 150.
133	29	Hume, Game-birds of India, I. p. 130.
134	11	Adams, Proc. Zool. Soc., 1858, p. 500.
134	27	Marienval, Bull. Soc. d'Acclim., 1876, p. 800.
134	31	Dewar, Bird Notes, VIII. p. 225.

Page	Line	
134	39	Macintyre, Hindu Koh, p. 83.
135	5	Donald, Jour. Bombay Nat. His. Soc., XIV. p. 174.
135	24	Pomme, Bull. Soc. d'Acclim., 1868, p. 369.
136	7	Mitchell, Proc. Zool. Soc., 1858, p. 545.
136	30	Sclater, Proc. Zool. Soc., 1879, p. 115.
136	31	Pomme, Bull. Soc. d'Acclim., 1868, p. 369.
137	26	Flocard, Bull. Soc. d'Acclim., 1910, p. 98.

DETAILED DESCRIPTION

Adult Male.—Of the many scores of male Impeyans which I have examined no two are alike. At the first intensive examination we realize that the metallic hues vary even from feather to feather as well as in the zones of colour in various individuals. So all detailed description is approximate only. Top and sides of the head and the face, together with the elongated crest feathers, brilliant metallic green. The under surface of the feathers is dead black, especially noticeable on the underside of the racket-shaped tips of the crest. The greatly elongated shafts of these are not bare but fringed narrowly with very short barbs expanding distally into the paddle or racket-shaped extremities. These spring from the centre of the crown and exhibit considerable variation both in number and degree of development. They vary from ten to twenty or more. In the case of the smaller numbers, they are very distinct from all the surrounding short, contour feathers, but where eighteen to twenty-two are present, there are often in addition a number of imperfectly developed crest-like feathers, only half the length of the typical crest, and with but slight development of the enlarged tip.

Back and sides of the neck changeable reddish copper; mantle golden green; chin and throat black, more or less strongly glossed with bluish green. A patch of purplish iridescence on the side throat in more highly glossed individuals extends as a narrow collar across the lower throat. The remainder of the upper parts usually dull brownish black. From the lower side neck a line of shining metallic green extends backward from the mantle and breast, and when the wing is closed this zone of colour joins the bend of the wing and outer coverts, which are of the same hue. The scapulars, interscapular region, inner wing-coverts, tertiaries and inner secondaries, rump and shorter tail-coverts are, on the whole, purplish bronze, edged, especially on the posterior portions of these areas, with bluish green. On the longer tail-coverts the metallic green covers all the visible portion of the feathers. Back pure white.

The secondaries are black, strongly glossed with greenish on the visible portions of the outer webs; the primaries are plain, dull, brownish black. The tail feathers are uniform rufous, becoming darker toward the tips. Mandibles dark horny, with the cutting edges and tips pale; irides pale hazel brown; orbital skin cerulean to turquoise blue; legs and feet varying from dusky to yellowish green; claws dark. Weight varies from 4 lb. 4 oz. to 5 lb. Spurs are stout, sharp and of moderate length, averaging 15 mm. or more. An adult male is about 700 mm. in length; expanse, 900; bill from nostril, 32; wing, 302; tail, 233; tarsus, 73; middle toe and claw, 71 mm.

Variations of Adult Male.—Not only do we find individual feather variations in abundance among male Impeyans, but sporadic differences of such importance that they have been considered to be valid species.

Several birds have been shot in the native state of Chamba, in the western Himalayas, with no trace of white upon the back. It was then discovered that the description which Latham gave of this pheasant made no mention of the white back, nor was it shown in his coloured plate. Thereupon by a process of logic, sound as far as it went, the old name of *impeyanus* was stripped from the common white-backed bird and replaced by *refulgens*. Then ensued a long argument, consuming much valuable printers' ink and paper, pro and con; whether the chance of Latham's having secured by accident a specimen of the rare Chamba bird, outweighed the possibility of his having erred in observation. I have found two solutions, both adequate: first, Latham himself settles the dispute beyond doubt; and second, the Chamba bird is nothing but a chance variation or mutation, of no significance from a taxonomic standpoint.

As to the first point, under the caption of Early History I have quoted the account of the Impeyan Pheasant from Latham's General History, published thirty-six years after his first contribution. Here he gives us the additional information that, "In the drawings of Lord Mountnorris is one of the male, with a large patch of white in the middle of the back, which I have not seen in any other representation of this singularly beautiful species." So there appears little room for doubt that Latham did have a black-backed specimen, if, indeed, he had more than the various sketches which he mentions.

Now, as to the evidence that the black-backed bird, alias *chambanus*, alias *impeyanus*, is no more than a variation, and without standing as a species. The white back in normal adult males presents one of the most variable characters of the plumage, not only in absolute purity or relative abundance of metallic markings, but in actual area. In only six specimens, selected at random from thirty or more, the length of the white patch varies antero-posteriorly from 95 to 155 mm.; while the distance from the posterior edge of the white zone to the tip of the longest tail-coverts may be as little as 63 or as great as 120 mm.

The occasional occurrence of albinism in adult male Impeyans, both partial, symmetrical and rarely complete, while it may have no direct bearing on the problem under discussion, should be mentioned.

Coming now to the actual black-backed birds themselves, examination of all the known specimens shows as great variability *inter se*, as the difference between them and normal male *impeyanus*. This will be evident from the following tabulation of the characters supposed to be diagnostic of the black-backed birds—

"Underparts entirely glossed with metallic golden green."
This gloss may be (*a*) typically like the above description;
(*b*) confined to the breast and irregularly down one side;
(*c*) confined to the throat and upper breast.
"Upper tail-coverts chestnut, tipped with golden green."
(*a*) typically like above description;
(*b*) an excess of green, with a little basal rufous;
(*c*) as in normal *impeyanus*.
"Lower back golden green."

This whole area impresses one as abnormal, as the metallic tips are so very small that they are completely separated and

> dominated by the loose, fluffy basal down, giving the appearance of half the normal number of feathers of this area having been lost. No such scanty, abortive metallic colouring occurs on any normal plumage of which I have knowledge. In typical white-backed individuals a small amount of metallic colour sometimes persists on all the white feathers.

In the presence or absence of the copper collar and the extent of the green mantle there is as great variation as in the above-mentioned characters.

As regards *mantoui*, the type in the museum of the Jardin des Plantes does, indeed, show the character of the "black underparts slightly glossed with green," but so also do many normal *impeyanus* when examined with the light coming from behind the observer. The throat has less green than is usual in normal birds. Hence the only differentiating character is the changed colour of the hind neck, nape and mantle. The normal copper of the nape and side neck is reduced and impure, the dominant hue of these parts being purple shot with copper. The mantle, as defined by a zone of solid colour, is of greater extent than usual, and wholly purple like the normal inner wing-coverts. Posterior to the mantle there is less purple in the plumage than usual. Several other so-called *mantoui* individuals at Tring and elsewhere show all gradations. Some have the typical mantle and not a trace of ventral green; in others the mantle is partly normal green, part purple and blue.

The variation to which the name *obscura* has been given is a melanistic phase, the wing and tail-coverts showing the greatest amount of iridescence, chiefly greenish, while the mantle is dead brownish black, almost unglossed, so that the general effect is of a bird once brilliant, but greatly faded. One individual wild shot Impeyan which I have examined, combines the characters of all these varieties with the additional one of having the rectrices wholly black, glossed with greenish blue. There is thus no ground for the recognition of these forms as other than extremely interesting variations occurring in a state of nature.

ADULT FEMALE.—General ground colour of head and upper plumage dark brownish black with very warm buff margins, and increasingly complex markings from the crown backward. On the forehead and crown there is a warm buff shaft-stripe. The feathers of the mid and hind crown are quite broad and lengthened into a short crest. On the occiput and nape a dark basal shaft-streak pushes its way up, gradually splitting the buff in two. On the mantle a pale buff shaft-streak appears in turn, dividing the preceding dark one, and on the rear mantle and wing-coverts the buff markings assume a rufous tinge and spread over the entire feather, forming wide, wavy, crossbands. On the larger wing-coverts and inner secondaries the tips of the feathers show considerable grey. The secondaries are brownish black, with a warm grey terminal border and a number of irregular rufous crossbars. The primaries are slightly mottled with rufous buff on the outer web. The mid and lower back, corresponding to the white patch of the male, are warm buff sparsely dotted with dark brown. The rump shows much solid dark colour and the tail-coverts are broadly tipped with white. Tail feathers dark brown, strongly barred with rufous and tipped with a conspicuous but narrow band of white. The black interspaces of the two central pairs are much clouded and mottled with rufous buff, especially toward the sides of the webs.

Chin and throat pure white, feathers of the side neck with more brown colour as we approach the upper plumage of the head. Upper breast like mantle, dark brown with a wide central area of pale buff split by a dark shaft-stripe. The lower breast shows a second pair of buff lines, and from here posteriorly the distinct markings disintegrate into an irregular barring or indefinite mottling. On the central feathers of the lower breast and belly a broad greyish-white shaft zone is conspicuous. The under tail-coverts are brownish black, with two oblique lines and a shaft-stripe of rufous, and a very broad white tip.

Weight about 4 lb. 8 oz. Mandibles rather pale horn colour, the upper darker, legs and feet pale yellowish but variable, claws darker; irides dark brown. Length, 635; expanse, 890; wing, 275; tail, 190; tarsus, 68; middle toe and claw, 66 mm.

NATAL DOWN.—Crown dark rufous. A short line back from base of culmen, lores, three short lines on facial area, ear-coverts and side of the occiput black. These markings are rather variable, however, and in birds of the same brood I have found considerable differences. Superciliary back over side neck, and facial area buff. Mantle and wing down grizzled rufous, back and rump purer dark rufous or chocolate, with two pairs of lateral pale buff lines, the outer pair often partly merged with the ventral colouring. Infra-loral line buffy cream. Chin and throat smoky white; sides of throat darker; remainder of under parts dirty buffy white, flanks much darker. Bill from nostril, 8; wing, 45; tarsus, 20; middle toe and claw, 23 mm. Iris dark hazel; legs and feet bluish slate; mandibles dark, paler at tip.

JUVENILE PLUMAGE.—Neither the down feathers of the head and neck nor the outer two primaries are quite as much delayed in their moult in the Impeyan as in the tragopans, although the difference is distinguishable only in a large series of specimens. The chin and throat, however, retain the primitive down for a very long time, the nape being the next in order of retention. When these small areas are the only patches of youthful plumage discernible, and the entire body is well clad in the juvenile garb, we find primaries 9 and 10 about 18 and 40 mm. out of their respective sheaths. The remaining juvenile primaries still show signs of growth with the exception of 3 and 4, which are full grown. Nos. 1 and 2 are already impatient, newly sprouted, first year flight feathers, No. 1 having broken loose for a distance of 40 mm., while No. 2 is yet an unbroken sheath. So swiftly does the garb of the little bird change, that down, juvenile and first year are all apparent at one time.

The juvenile plumage, especially on the upper portions of the body, is remarkable for its simplicity of pattern; a long, narrow, pale buff shaft-stripe bounded by black being the chief character. This is found from the forehead to the very longest wing-coverts. It is, however, absent or indefinite on the feathers of the lower back and rump, which are pale yellowish buff with a little dark mottling, anticipating the very specialized colouring of this area in the adult. On the back and coverts the simplicity of the pattern is somewhat interrupted by crossbars of rufous, the most anterior of which frames two circles of black. The secondaries show four to six crossbars of buff which, however, terminate abruptly halfway down the inner web, leaving that portion plain dull brown. The primaries are clear brown save on the very outer margin. The short, pointed tail feathers vary considerably in different individuals, but usually show a tendency to develop a single series of central spots down the shaft. In other individuals, marginal spots extend down both webs, leaving the central portion clear brown. In the coming first year plumage these will become crossbars; in the adult they will give place to uniform unmarked chestnut.

Starting abruptly at the edge of the down of the throat, we find the breast and the entire under surface much alike, the larger part of each feather buffy white, with an irregular narrow margin of dark brown. Birds of this age measure: bill from nostril, 20; wing, 190; tail, 81; middle toe and claw, 33 mm.

First Year Plumage, Male.—When at last the chin and throat feathers do begin to be renewed, they prove to be diagnostic of the sex, and I have never seen a single individual in which they were not either pure white if the bird was a female, or at least edged with black in the case of a male, while usually in the latter sex the central chin and throat are quite black.

When we examine young males after the first autumn moult we see what a difference results from the slight acceleration of the head and neck moult, in comparison with tragopans of the same age. The average young Impeyan male shows an even, brown coloration of the head in conformity with the remainder of the plumage. Throughout the plumage we find that the pattern of the juvenile garb has become more complex. To the black, buff-streaked crown feathers is added a fringe of buffs, and these are lengthened and truncate. On the nape a black shaft-streak creeps up the rhachis, splitting the buff stripe. Posteriorly, more concentric bands appear, flattened terminally so that crossbands of grey and dark brown are formed. On the whole of the wing-coverts the terminal bands disintegrate into a grizzled freckling, while the two lateral black ocelli have come into being, strongly accentuated by frames of warm buff. The lower back and rump are buffy white, marked with fine, numerous, concentric dark bands.

On the secondaries we find a series of wavy but regular transverse bands of warm buff on a black background, the bands being confined more and more to the outer web as we proceed outward. The primaries are almost unmarked. The rectrices are similar to the inner secondaries, but still more evenly barred with rufous, and all are tipped white. The exposed parts of the largest tail-coverts are pure white.

The ventral surface shows considerable individual variation, but on the whole is white or buffy in the centre of the feathers, mottled or solidly bordered with dark brown. The under tail-coverts are black, with a wide shaft-stripe which begins halfway up the feather, widens gradually, and terminally suddenly expands so as to include the whole distal portion. These feathers are very conspicuous by reason of the purity of the black and white, the latter being wholly free from any buffy tinge, and hence very unlike the rest of the plumage. First year males average: bill from nostril, 27; wing, 268; tail, 198; tarsus, 71; middle toe, 71 mm.

In few other species of birds can the accidental loss of feathers during the first year of the young male be traced as surely as in the Impeyans. Clad in a plumage of dull mottled grey and brown, whenever a feather of the body is tweaked out, it is replaced by a scintillating, iridescent plume which glows like the most brilliant jewel among the surrounding dull feathers. In this way we may find birds which are studded here and there with these adventitious feathers, or occasionally a whole patch will mark the place where the bird was perhaps seized by an eagle, or dashed itself against a branch in some sudden agony of escape. We may even tell about what time the damage was done, as after January or February ingrowing feathers have the full colours of the adult, while those which appear in the late autumn are tinged with signs of immaturity.

Second Year Moult, Male.—When the real moult begins, in the autumn of the second year, there is no delay. Soon every part of the bird shows the startling change, and there is a period when it seems to be almost equally fretted over the entire body, dull mottled brown alternating with brilliant iridescence.

The primaries begin to fall in regular sequence from No. 1 outward, the dull brown flight feathers with their marginal buff mottling giving place to the jet-black, immaculate new feathers. At this time, before all the primaries have been dropped, in about fifty per cent. of the individuals, the two juvenile flights, numbers 9 and 10, can be readily distinguished from the others by their narrower, more pointed form, and two small terminal shaft-streaks of buffy white. In other birds (in which, perhaps, their initial start was more delayed) they are exactly similar to the succeeding ones.

The moult of the secondaries lags somewhat behind the shedding of the primaries, and three or four of the latter are well grown before the first of the secondaries falls—usually the third from the outer. This is succeeded by the fourth and so inward, the outer two being shed about a week or more later. In fact I have examined a large number of specimens in which these two outer secondaries are the last remaining first year flight feathers. As the old feathers are so strongly mottled and barred with buff, the change is even more striking than in the case of the primaries—the new secondaries being like the other flights, dull greenish black. Adventitious growth of rectrices is very evident before the autumn moult of the second year. Such a bird may still have all the first year mottled buffy tail feathers, except one or two which have been torn out in some way and replaced by others with the rich chestnut of the adult ornamented with several broad black bars—a striking pattern which would never normally occur. They are, perhaps, an inch longer than their fellows. The forced growth in such a case must have come when the adult hue was ready, but sufficient of the immature dark pigment left to be incorporated. Practically all wild Impeyans assume their fully adult dress at the second autumn moult, but in captivity birds not rarely retain many traces of immaturity even after this moult. This occasionally occurs in wild birds, and I have seen an individual which, due to some abnormal factor such as malnutrition, has at this moult attained a halfway state of plumage, and for another twelvemonth it must bear upon its plumage white throat frecklings, rufous tips to the coverts, a mottled back and the half-barred tail which deprives it for another year of the wonderful beauty of a cock in full plumage.

EARLY HISTORY AND SYNONYMY

From the point of view of its scientific name, the Impeyan Pheasant has had a most unsettled time of it. I have discussed the causes for this in full elsewhere.

The first specimen of this species of which we have any record was a bird received by Dr. Johannis Latham and described and figured by him under the name of the Impeyan Pheasant in the Supplement to his General Synopsis published in 1787. Three years later he included it in his Index Ornithologicus as the tenth species of the genus *Phasianus* with the specific name of *impejanus*. The donor of the bird, in honour of whom it was named, was Lady Impey, wife of the first Governor of Bengal. In 1823, thirty-six years after his first contribution, Dr. Latham again figures the bird, and in volume viii of his General History gives us what is probably a summary of the knowledge of the Impeyan Pheasant at that day. I repeat it in full. "The above inhabits India, but not common, being brought from the hills in the northern parts of Hindustan to Calcutta, as a rarity. Lady Impey attempted, with great prospect of success, to bring some of them to England, but after living on board for two months they caught a disorder from the other poultry, and died; the food they had, during the passage, was rice in the husk; and I was informed, that they are known in India by the name of Monaul, which is foolishly translated Mouth-piece; that the male is called by some the Golden Fowl. They bear cold, but are impatient of heat. The cock never observed to crow, but had a strong hoarse cackle, not unlike that of a Pheasant.

"This species is finely expressed in Sir J. Anstruther's drawings, but the bird does not seem to stand so high on its legs as it appears elsewhere; nor is the bill so very long and hooked; we may therefore suppose, that the accretion only takes place in those under confinement, where the necessity of providing food, by raking up the ground, does not occur; and the bill, of course, less worn. I observe that the hind claw is very crooked, and the tail is very little darker at the end than the rest of its length.

"In the drawings of Lord Mountnorris is one of the male, with a large patch of white in the middle of the back, which I have not seen in any other representation of this singularly beautiful species.

"In General Hardwicke's drawings, called Moory Zereen."

For many years afterwards more or less garbled versions of this account were made to do duty by numerous authors in their contributions to ornithology.

SYNONYMY—*Lophophorus impeyanus* (Latham)

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Phasianus curvirostris Shaw, Mus. Lever., 1792, p. 101, pl.

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Monaulus impeyanus Vieillot, Gal. Ois., II. 1825, p. 31, pl. 208.

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CHINESE IMPEYAN PHEASANT

Lophophorus lhuysii Verreaux and Saint-Hilaire

NAMES.—Specific: *lhuysii*, for M. Drouyn de Lhuys, President, in 1866, of the Société Imperiale d'Acclimatation. English: de Lhuys's Moonal Pheasant; Chinese Impeyan or Monal. French: Lophophore Drouyn de Lhuys. German: Schwarzschwänzige Stahlhuhn. Vernacular: Ho-than-ky (Fowl-of-burning-coals), Pae-mou-ky (Succulent-tuber-bird), Chinese.

BRIEF DESCRIPTION.—Male: Except for very large white patch from the upper back to the tail, the upper parts are highly iridescent; head green, occipital crest purple; mantle red-gold; wings and tail chiefly bronze-green. Under parts black, slightly margined or glossed with iridescence. Female: White dorsal patch as in male; rest of upper plumage dark brown, rather sparingly mottled and irregularly barred with rufous buff; flights and tail feathers with more regular rufous bars; face and throat whitish; under parts very dark brown, with less mottling than above, the feathers with conspicuous white, irregularly shaped shaft-streaks.

TYPE.—Mountains of Moupin, western Szechuan; Verreaux, Bull. Soc. d'Acclim., 1866, p. 223. In the collection of the British Museum.

RANGE.—Central China, in Szechuan and Kokonor.

GENERAL ACCOUNT

Our knowledge of this bird is most meagre. Its distribution bears much the same relation to that of *impeyanus* as does that of the Chinese Blood Partridge (*I. sinensis*) to the Himalayan species (*I. cruentus*). We know of specimens which have been obtained in western and north-western Szechuan and in south-eastern Kokonor. The localities of eastern Yunnan and Kansu are as yet doubtful.

The few scattered notes in regard to its life history show that it differs in no radical way from the Himalayan Impeyan. It is found during the day in small parties, sometimes males and females in separate companies, often frequenting the open rocky tundras or barren mountain meadows at twelve to sixteen thousand feet elevation, well above the zone of forests. At night the birds descend to perch either in the dense, scrubby, stunted rhododendrons, or still farther downward among the sheltering branches of the pines. The food consists of vegetable substances, and especially of succulent roots and tubers, for which, in true Impeyan fashion, it digs with its broad, strong beak.

The names which the Chinese have bestowed upon it show how strong an impression the bird has made upon them; but, unfortunately, it is not only their imagination which is affected, for we read that the bird is everywhere uncommon and soon will disappear entirely. This is owing to the zeal with which the natives pursue it, capturing it by setting great numbers of wire snares, as they have learned that its flesh is very delicate. The cry is described as consisting of three or four separate, loud, piercing notes, uttered in early morning.

Wilson gives the following account of the Chinese Impeyan or Monal. "Scattered through the same region as the White Crossoptilun, only at greater altitudes, occurs the magnificent Monal Pheasant, at once the most gorgeous and rarest of all game-birds

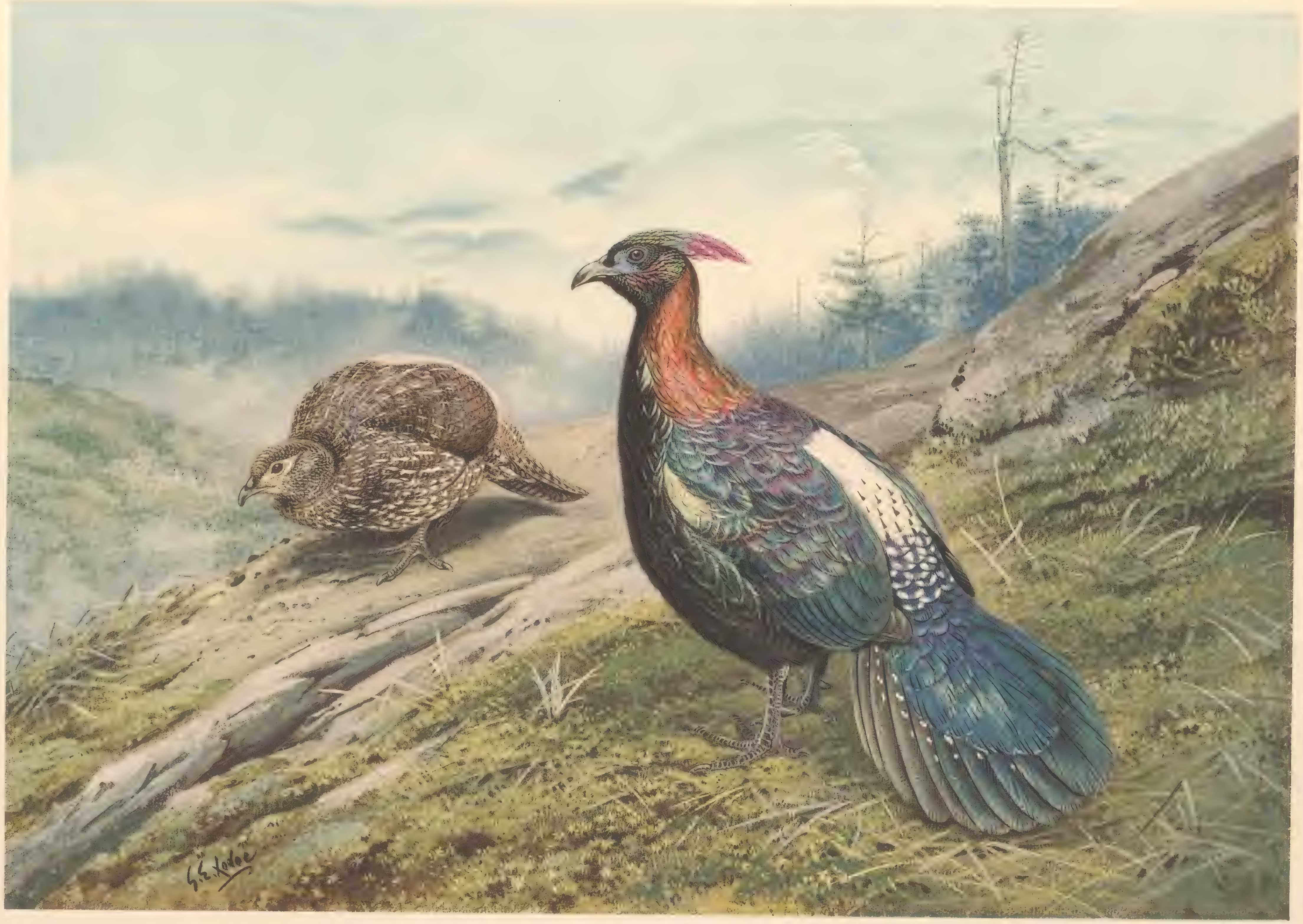
PLATE XVI

CHINESE IMPEYAN PHEASANT

Lophophorus lhuysii Verreaux and St.-Hilaire

In the heart of Central China, wandering over a limited zone of the highest mountains, this bird is making a brave fight for existence. The Chinese trap it on every occasion, and it is hardly possible that it can exist for many more years. No white man has seen it alive. The Chinese, inspired by the beautiful metallic lustre of the feathers, call it Ho-than-ky, the fowl-of-burning-charcoal.

PLATE XVI



CHINESE IMPEYAN PHEASANT.

found in these regions. Both David and Pratt comment on the rarity of this bird, and my experience is in accord with theirs. The King of Chiala detailed hunters specially for the purpose of securing specimens for Zappey, but no birds could be found. I was informed this bird was comparatively common east-north-east of Sungpan Ting, in rocky places between 13,500 and 14,500 feet altitude, but I never met with one in that region. The only specimen that came under my observation was strolling about the margin of rocky scrub immediately above a wood of alpine larch, on the Ta-p'ao shan (between Romi Chango and Tachienlu), altitude 12,000 feet. In this particular locality I was told the Monal was fairly plentiful, but I doubt it. Hunters are ever on the look-out to shoot and trap this bird, and the species is undoubtedly threatened with extinction.

"The magnificent bird has several local names. Around Tachienlu it is commonly called 'Hwa-t'an-che' ('Oak Charcoal Chicken'), or 'Hoa-t'an-che' ('Burning Charcoal Chicken'), both names having reference to the colour of the upper part of the back and neck, which resembles the intense glow of a charcoal fire in full blast. A Thibetan name, which is used around Tachienlu and Sungpan Ting, is 'Koā-loŏng.' This name has reference to, and indeed simulates, the call of these birds, which is clear and distinctly quadrisyllabic. This call is usually heard in the early morning, but in wet weather it may be heard at any time of the day.

"A favourite food of this bird is said to be the bulbs of various species of Fritillaria. The bulbs, known as 'Pei-mu,' are highly valued as medicine by the Chinese, and many men earn their livelihood collecting these and other medicinal herbs in the alpine regions of Western China."

DETAILED DESCRIPTION

ADULT MALE.—Frontal featherlets extended as a narrow line at posterior edge of nostrils, and a roundish patch 7 mm. across below the nostrils, jet black. Most of the face, forehead and broad superciliary line, not bare but covered with short black featherlets. Crown, lower face and ear-coverts iridescent green, changing to pink. The crest of elongated feathers slightly or not at all constricted midway to the tips, springing from the hinder crown, iridescent, changing from purple to bronze; the hind and side neck and mantle are rich dark, red gold, changing to a bronze green. Scapulars and wing-coverts variable, and much as in *impeyanus;* the upper back and inner coverts purplish blue, with green-shot tips, while the bend of the wing and the lesser coverts are, like the crown, shining green. The fault bars on the green wing-coverts are visible as coppery red bands.

The white dorsal patch is considerably larger than in *impeyanus.* It starts close behind the mantle and extends to the tail-coverts, dying out only upon the longest coverts. Rarely it is pure white throughout the greater extent, but the white feathers are very different in character from their iridescent neighbours, in that only a small portion, about 13 mm., of the tip, is solid, all the remainder (about 50 mm.) being decomposed down. Most of the feathers are marked with a little terminal triangle at the tip of the shaft, black where it is in immediate contrast with the white (this visible only with a lens), but becoming at once brilliant purple bronze. Posteriorly this mark increases in size, pushing down along the shaft, the increase, however, being chiefly dark brown or black. When this colour has reached a distance of 13 mm. it begins to expand at the extremity, and soon reaches the edge of the vanes, thus cutting off two patches of white at the extremity of the feather. These become more and more restricted, and the one on the outermost vane on the tail-coverts of each side soon vanishes, and on the last of the shorter coverts there is no white, these feathers and the succeeding row of very long coverts showing the iridescent variability of the greater coverts, being bronze green, changing to rich purple, or with various combinations of these hues. The same iridescence is present on the outer half of both webs of the central pair of tail feathers, and on a lesser portion of the outer webs and the extremities of the others. The remaining portion of the tail feathers is almost dead black, marked with small, irregularly shaped white spots, usually in pairs, about ten pairs on the central feathers and more on the outer ones. On the inner webs of the outer tail feathers some of the spots assume a transverse banded appearance. There is much variation, however, and occasionally the spots are so numerous that they give the feathers a mottled appearance. Those on the outer webs are much more regular, and when the tail is partly spread, the successive rows of white are a very striking feature.

The primaries are dull brownish black, while the secondaries show more and more greenish iridescence on the outer margin and tip as we proceed inward, the rule being that all the exposed portions of the closed wing are iridescent.

The chin, throat and upper half of the neck are black, with tiny iridescent tips, while the feathers of the under parts and sides are black, with shining greenish margins, even this hint of colour disappearing on the belly and flanks, but appearing quite strongly on the under tail-coverts.

Iris hazel brown; mandible dark horn, tipped and edged with pale yellow horn; lores and all the bare skin between the eyes, gape, almost to the posterior edge of nostril and well up on the forehead, rich dark blue. Feet and legs dark horn. Length, 800; bill from nostril, 41; wing, 334; tail, 306; tarsus, 72; middle toe and claw, 82 mm.

ADULT FEMALE.—The lores (except sub-narial patch) and entire face covered with creamy-white featherlets; chin and throat same colour. Entire anterior upper body plumage dark brown, brokenly banded or marked with pale rufous buff. On the fore crown these markings are in the shape of a noded, irregular shaft-stripe; farther back this breaks up into several paired spots, and then into two lateral, longitudinal stripes, which in turn break into spots, and on the mantle widen into transverse bands of reddish buff. This remains unchanged on the concealed portions of the coverts, but becomes an irregular mottling on the exposed parts.

On the secondaries the transverse bands extend to the tip, are very regular, and more warmly rufous in hue. On the primaries they persist only as a faint mottling of the outer margin.

The most pronounced character of this sex is the presence of the male white dorsal patch, this being as large in extent and even more purely white than in the other sex. The transition to the coloured tail-coverts is entirely unlike the male. Dark markings appear as subterminal dark brown mottlings, the whole feather except a shaft-stripe and a terminal fringe being affected. As we proceed backward the shaft-stripe disappears, and the mottling becomes more dense until, except for the terminal fringe, the feathers closely resemble the anterior upper plumage. The cold grey colour predominates, however, and there is no warm rufous, only pale cold buff. On the longer coverts the barring is rather more rufous, but much of the margins are irregularly mottled.

The tail feathers closely approximate the central secondaries, but have a greater extent of bright rufous, which alternates with black to form wavy transverse bars, both colours being about equal. The black bars of the central pairs are rather broken at the margin, as are those on the outer webs of the next two or three pairs, the barring becoming more regular and distinct as we pass toward the outer pair. The number of bars of each colour varies from fourteen to eighteen or more.

The white feathers of the throat become barred with buffy on the lower neck, but almost at once develop a pure white shaft-stripe, which increases in size posteriorly, and contributes the dominant ventral character of the sex. A feather from the mid-breast shows an elongated shaft-stripe, increasing in size distally, the remaining part of the feather being of the usual dark brown hue mottled with indistinct broken bars of pale buff. On the belly and sides the white exceeds the mottled portion in area. On the flanks the white becomes restricted, and toward the tarso-metatarsus joint shows only as a terminal spot. Mandibles dark horn, with pale yellowish horn edges and tips; irides dark brown. Length, 760; bill from nostril, 38; wing, 317; tail, 266; tarsus, 71; middle toe and claw, 76 mm.

First Year Plumage, Male.—The several birds in this plumage which I have examined show very great variety in the advance or retardation of colour and pattern, showing that the moult occurred at correspondingly different ages. The general appearance is of a female above and a male below with a few scattered adventitious metallic feathers on the mantle and coverts. The pattern of the tail is much like that of the female, except for a sprinkling of green iridescence on the outer webs, and the black bars being twice as wide as the rufous ones. Many of the latter are decidedly pale and broken on the inner webs—a hint of the adult male plumage. The chin shows some white, and shaft-streaks are abundant on the neck and sides. The wings are decidedly feminine, but the markings on the secondaries are rather mottlings than bars, and pale buff, not rufous.

A male with more advanced patterns shows much spotting and very little barring on the tail, fewer shaft-stripes on the ventral plumage, and although the lores are still covered with featherlets, these and the facial ones are chocolate instead of white—an intermediate stage on the way to the adult black. The measurements of this individual are all nicely correlated with the slight advance in plumage characters, being a few millimetres greater than in more feminine-coloured individuals. Birds of this age show average measurements of: bill from nostril, 36; wing, 306; tail, 286; tarsus, 71; middle toe and claw, 76 mm.

EARLY HISTORY

The first specimens of the Chinese Impeyan were sent from Hankow, China, by the French consul, M. Dabry, in the year 1866. They were said to have been collected in the mountains of Moupin in western Szechuan. These were a pair, and were described by M. Jules Verreaux of the Museum of Paris. Both are now in the British Museum.

SYNONYMY—*Lophophorus lhuysii* Verreaux

Lophophorus lhuysii Verreaux, Bull. Soc. d'Acclim., 1866, p. 223; Verreaux, Bull. Soc. d'Acclim., 1867, p. 706; Sclater, Proc. Zool. Soc., 1868, p. 1, pl. I; Sclater, Ibis, 1870, p. 297; Gray, Hand-list Birds, II. 1870, p. 261; Swinhoe, Proc. Zool. Soc., 1871, p. 399; David, Nouv. Arch. Mus. de Paris, VII. 1871, p. 11; Elliot, Monogr. Phas., I. 1872, pl. 19; David and Oustalet, Oiseaux de Chine, 1877, p. 403, pl. 110; Grant, Cat. Birds Brit. Mus., XXII. 1893, p. 281; Grant, Hand-book Game-birds, I. 1895, p. 238; Beebe, Zoologica, I. No. 15, 1914, p. 271.

Lophophorus lhuysi Gould, Birds of Asia, VII. 1873, pl. 54; Sclater, Ibis, 1874, p. 169; Seebohm, Ibis, 1891, p. 379 [western Szechuan]; Pratt, To the Snows of Tibet through China, 1892, p. 202; Sclater, Ibis, 1894, p. 107; Sharpe, Hand-list Birds, I. 1899, p. 34; Dresser, Manual Palaearctic Birds, II. 1903, p. 674.

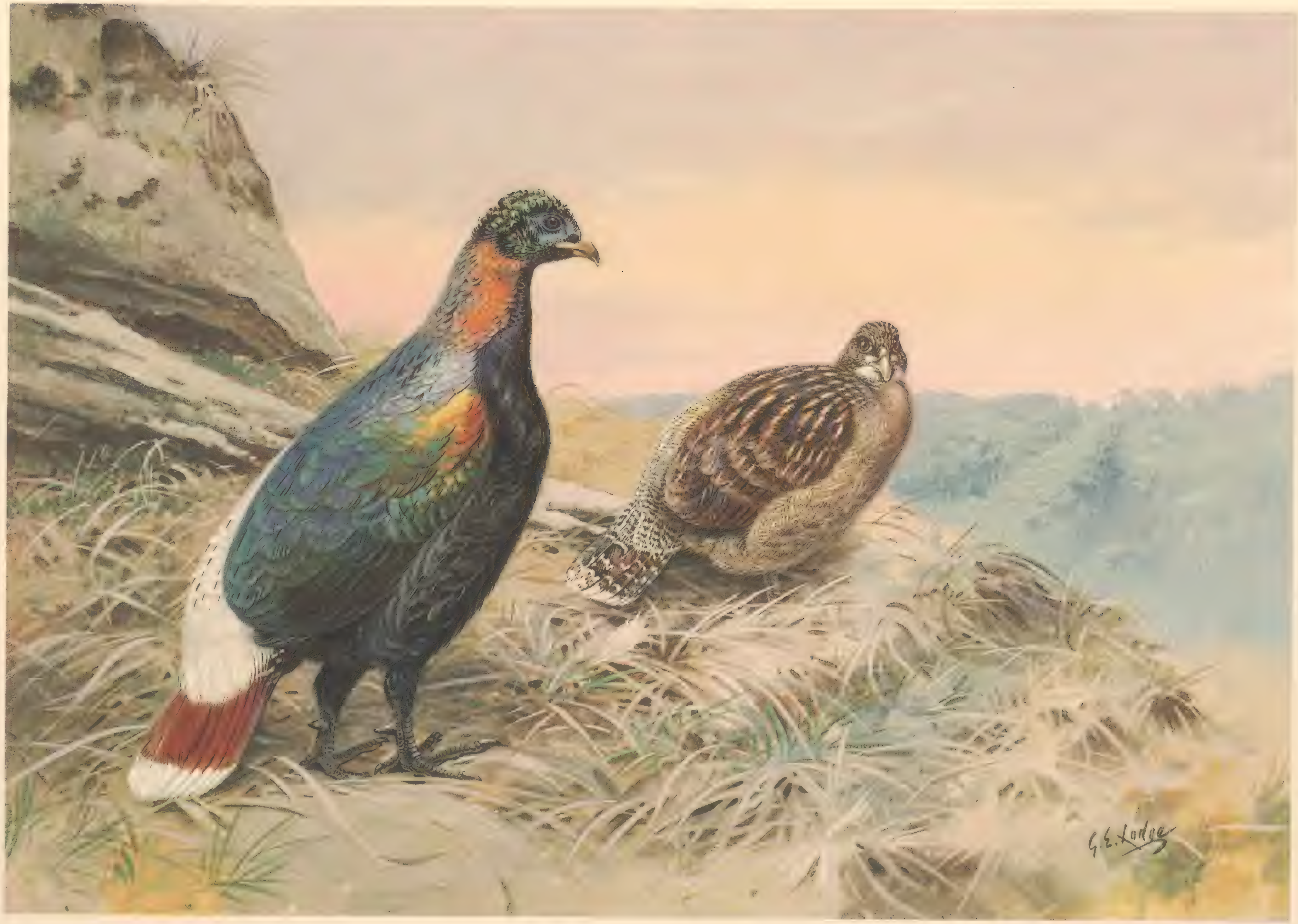
PLATE XVII

SCLATER'S IMPEYAN PHEASANT

Lophophorus sclateri Jerdon

The least known of all the Impeyans is this curl-crested bird, clad in shimmering gold, green and blue iridescence. Until now, only the wild tribes of Aborland have known where to find it, and the few skins in our museums have been secured by them. After a day of difficult exploration, I found three of the Impeyans deep in the wilderness of northern Yunnan. One I secured and the two others boomed away over the bamboos, far off into the distant valley. Their haunts are so well guarded by savage tribes that it may be impossible to see them before the birds become extinct. So limited is the region they inhabit, so narrow are the upper ridges on which they make their home, there can be but few of them alive in the world.

PLATE XVII



SCLATER'S IMPEYAN PHEASANT.

SCLATER'S IMPEYAN PHEASANT

Lophophorus sclateri Jerdon

NAMES.—Specific: *sclateri*, for Dr. P. L. Sclater, the eminent English ornithologist. English: Sclater's Impeyan, Crestless Monal. French: Lophophore sclater. German: Stahlhuhn.

BRIEF DESCRIPTION.—Male: Upper plumage iridescent, lower black; head with short, recurved green feathers; neck copper; mantle and inner wing-coverts green changing to purple; outer coverts coppery or green; back, rump and tail-coverts white; tail dark chestnut, with a broad, white, terminal band, black mottled with white at base. Female: Lores, chin and throat white; head, face and neck black with V-shaped buff marks; mantle and back dark umber, with pale rufous shaft-stripe and mottling. Wings more rufous; tail black, banded and tipped with white; lower back, rump and upper tail-coverts pale grey with fine, irregular dark bands. Lower parts olive, finely vermiculated with pale buff.

TYPE.—"Mishmi Hills, Upper Assam." Jerdon, The Ibis, 1870, p. 147. Now in the collection of the British Museum.

RANGE.—Mishmi and Abor Hills eastward into the mountains of northern Burma and Yunnan.

GENERAL ACCOUNT

ALMOST nothing is known of the Himalayas east of Bhutan and north of Assam. They are inhabited by fierce tribes who allow no strangers to enter, or at least to leave their domain. It is from this mysterious hinterland that the hill tribes, the Mishmis, the Abors and others come down, when they venture to appear for purposes of trading. Every year a fair is held at Sadiya, at the extreme head of the Assam Valley, and this is attended by many of these savage people. Among other things, they occasionally bring with them skins or even live birds, and it is in this way that the few specimens of Sclater's Impeyan have been secured. As far as I know I am the first white man who has seen or shot this species in its native haunts. Thus may we account for the absence of a single fact in literature regarding its wild life or even more than a general vague idea of what region it inhabits.

Wholly unexpectedly I met with Sclater's Impeyan in north-western Yunnan, close to the Burmese border, when studying the pheasants of that region in the winter of 1910, and am therefore fortunate enough to be able to relate something at first hand of the bird in its home. This is so meagre, however, that I shall give the experience just as I find it in my journal, with all extraneous details which in any way may help to picture the environment of this rare pheasant.

One very characteristic feature of the high mountain slopes along the extreme northern Yunnan-Burma frontier is the lasting character of the scars made by the native millet farms of past decades. In place of the splendid oaks and chestnuts, there springs up a terrible stubby growth of bamboo, to penetrate which is a punishment leaving lasting wounds and complete fatigue. Yet one must force a way through many such zones to find the pheasants which here make their home.

One of the greatest triumphs of my pheasant search came at the end of a cold, bracing day in early winter. I was camped upon the bare summit of a rounded knoll, and all through the night there was heard the sound of the rushing waters which tumbled over the great boulders of the deep ravines on either side. Except for this the nights were, as a rule, silent; the most startling sound being the frantic squeal of an unfortunate pig, pursued or caught by some beast of prey.

Waking in the early dusk, one heard only the soothing, distant roar of the streams, and now and then the footstep of the Gurkha sentry. Hardly had the jungle of the opposite slopes appeared through the cloud-drenched dawn, when the notes of a whistling thrush rose clear and sweet. A splendid, sturdy bird, making its home among the moss-hung oaks, over a mile above the sea—its song was worthy of owner and place. Its blue-black coat was still wet with dew as its throat poured forth a series of penetrating flute-like tones. They rose above the roar of the torrent, and for a half hour jungle and mountain were silent, listening to this superb matin. Then, as suddenly as it began, the song ceased, and not a note was heard until at dawn again the following morning.

Close upon the brightening of the dawn came another sound, not of the wilderness and yet with a wildness hardly human—the pitiful wail of some insane Kachin child, which had awakened from its bitter sleep to its still more bitter daily life. It strove to put its poor deformed mind upon the task of gathering a few of the myriad sticks lying everywhere in the jungle, to carry them to the hut of some native—perhaps its parents who have discarded it, or of a strange Chinese—in exchange for a mouthful of rice. What heart could fail to be moved by the terrified sobbing of these poor creatures which haunted the forests about every village, where even the normal natives lived day and night in dread of the tiger-formed, evil "nats." Apart from nature as they were, one could not enter these regions without encountering these hopeless waifs, haunting jungle and trail.

The light now came quickly, and with it a multitude of birds' voices, and from the distant jungle the jubilant rollicking chorus of the jolly hoolick gibbons. Every creature here is a sun worshipper—for shade means the chill of death, and sun the bracing warmth which one can enjoy best only upon these high roofs of the world.

The sun had topped the great jagged barrier which led straight down from the heart of the unknown north, and on our sturdy little mountain ponies we crossed a foaming stream and began a stiff zigzag climb, the trail full of deep ruts and rolling stones. Now and then we came to a ledge over which the horses scrambled on knees and hocks. At the last open field we dismounted, and turned the ponies over to the Sikh. At an angle of forty-five degrees we slid, scrambled and scraped our way through the soft ground to the bottom of the ravine where the cold shade of early twilight still reigned.

Here we separated, and I made my way slowly up stream, creeping over the great rounded boulders, or wading through the rush of icy water. Every turn revealed new beauties. An enormous overhanging mass of quartz loomed up draped with swaying vines, and, beyond, a little sandy bay was fretted with the tracks of pheasants, cats and deer. In the spots of sunlight among the higher branches crimson butterflies flitted about, and white-fronted redstarts dashed ahead from stone to stone.

Stopping at a favourable opening, a half-mile up stream, I began my laborious climb upward, first through a steep ascent of soft mould densely shaded by wild-sown bananas. The undergrowth seemed scant, and as I brushed aside the first thicket of soft-leaved plants I anticipated an easy first stage. But the grey down on the myriad green stems proved scourging whips of nettle which lashed face and hands at every step. There was no alternative, so I clambered painfully on, seizing hold of every cold, smooth-enamelled banana trunk as a haven from the merciless needles.

A small side ravine spread out into a broad, fern-filled bog, and the nettles were left behind. Then came more bananas and small evergreen trees with little or no undergrowth. Here was the feeding ground of the pheasants and deer. There was hardly a square yard of mould which did not bear the marks of the tiny hoofs of the barking deer or the strong claws of the birds. Now and then I picked up a feather of some silver pheasant clinging to a bramble on the steep slope. The earth was crumbling and again and again I fell headlong. Once I grasped a banana and brought it over upon me—a light, air-filled stem bearing streamers of old, crackling leaves, and a rosette of long wavy green ones. As I struggled, face and ears half covered with earth, my hand touched something which seemed to move. I turned my head and became suddenly sick with horror as I saw a king cobra crawling slowly out of the fallen debris, fortunately making its way to the other end of the prostrate banana stem. Its body was dull and brown, and trailing along, crackling like the dead palm leaves, were remnants of half-shed skin. My touch upon the sinuous body had seemingly not disturbed it.

If it had changed its course and turned toward me I could not have escaped from its path, half pinned down as I was by the mass of leaves and the stem. I watched the tapering point of the tail slowly disappear, and, weak-kneed and trembling, crept slowly off in the opposite direction.

Fortunately serpents of all kinds are rare, and this most fatal and irritable species is nocturnal. I had disturbed it among the roots of the palm by my awkward fall. During the past week it was not at all unusual to find king cobras in the deadfalls of the natives.

I had hardly crept five yards from the place of my ugly adventure when two feathers caught my eye, and straightway I forgot my fears. They were from the plumage of no silver pheasant, but brilliant, iridescent, changeable green and purple. I was at a loss to know from what gallinaceous bird they had come. A little way farther I found another. Later, while worming my way through a barking deer's tunnel at the roots of a perfect tangle of bamboo, I heard subdued chuckles and the rustling of leaves ahead. A few feet brought me to a deeply worn but steep sambur trail, along which I made my way on hands and knees, without making a sound.

The rustling of leaves and the spray of earthen pellets falling down, came more distinctly to my ears, and at last I rested for many minutes with my face buried in a clump of blue, sweet-scented pea flowers.

Inch by inch I then edged myself upward, digging with fingers and toes into every deepened hoof-rut. A shower of earth fell upon me, and with joy I saw that a clump of soft-leaved, mint-like plants lay before me. I did not have to increase my numerous wounds by a slow penetration of either nettles or briers.

The revelation came sooner than I expected. Noiselessly plucking away leaves and stems one by one, to form a low tunnel, I pushed slowly and cautiously ahead. Never have I been "closer to Nature" than on this stalk. My trail was more like that of a snail or worm than of any vertebrate! Glints of light filtered through the green ahead, and I saw that a low, perpendicular bank of earth barred my way on each side. Then the forms of one or two birds appeared, and with a screen of leaves still intervening, I watched what was probably the first wild Sclater's Impeyan ever seen by a white man. A minute after I had reached my last position, one of the birds shook itself with all its might, sending down a shower of dirt into my eyes, while a feather or two floated off above me, down the hillside.

An inch nearer, another leaf cleared away, and I saw that there was but one bird, the appearance of the others being caused by several large mottled caladium leaves, waving about just behind the pheasant.

It was a splendid male, digging vigorously and almost continuously with its beak, working gradually around in a circle, so that I saw in turn its breast, sides and back. I watched it for five minutes, when it turned, without apparent cause, but not from fright, and disappeared into the low, marshy tangle behind.

As quick as I could lift my arm and pull up my gun from where it was dragging behind me, I fired at the still moving stems, and listened for some hint of the effect. Not a sound came forth.

I clambered up to where the bird had stood, rushed into the underbrush, and almost stepped upon the pheasant as it lay six feet from the opening. As I leaned down, trembling with excitement, two living bombs burst from the ground a few feet away—a pair of hens, or young males—and in the fraction of a second were out of sight.

On succeeding days, although I made inquiries everywhere, I could find no native who had ever seen or could give a name to this bird. The three which I blundered upon were doubtless strays from farther north, from somewhere in that mysterious land where no white man may go at present and live. Had I a yellow skin, slanting eyes, long hair and a knowledge of the twanging words which came to my ears each night from my servants' camp-fire, I might have followed these birds northward. As it is, strange people guard their haunts, neither Chinese nor Tibetans nor Kachins, but a mingling of the blood of all three, jealous of their useless land, living their bestial lives in filth and cold and squalor amid the howling winds of these heartbreaking steeps.

At any rate we must extend the range of this bird, and connect the Mishmi Hills with the mountains of the Salween. The male which I secured was feeding on short, crooked bits of succulent rootlets, and with these it had swallowed a surprising amount of earth and other débris.

DETAILED DESCRIPTION

Adult Male.—Lores bare; forehead and face sparsely feathered with tiny, oval, green feathers. A dense, round clump of featherlets just at base of nostril. Top of the head bluish green shot with purple, the feathers being strongly recurved forward, ear-coverts with a stronger purplish sheen, but not curled. Back and sides of the neck

PHOTOGRAVURE 12

YUNNAN HOME OF SCLATER'S IMPEYAN

The steep slope of sprouting bamboo was most terrible to climb. I made my way through the shaded ravine running obliquely upward through the centre. On the way up, I found innumerable traces of barking deer and Silver Pheasants, and I disturbed a king cobra from his den at the foot of a wild banana. At the summit, beyond a tangle of caladiums and painted leaves, I encountered the three Impeyans. The full-plumaged cock was scratching among the undergrowth shown in the lower photograph, and at my blind shot fell in the same place. The others flew up a few feet beyond and scaled out of sight down the opposite slope.

YUNNAN JUNGLE HOME OF SCLATER'S IMPEYAN

shining reddish copper. Mantle, longer scapulars, inner median and greater wing-coverts and tertiaries deep purple changing to metallic green. Coverts around extreme bend of wing form a patch of brilliant metallic green, changing to blue and purple. Shorter scapulars and remainder of wing-coverts golden green and rich glowing copper. Inner secondaries shining golden green; this disappears as we proceed outward, until the last trace vanishes from the outer webs. Primaries and their coverts dead black. Back, rump and upper tail-coverts pure white, with very narrow, black, shaft-streaks on the rump and shorter tail-coverts. All of the white feathers show a wide, glistening white, somewhat disintegrated fringe. Entire under plumage dark brownish black, glossed with purple on the throat, sides and flanks. Tail rich dark chestnut, with a broad terminal band of white; the concealed half of the feather is black, with five to seven irregular white crossbars, much broken into spots. The tarsus is feathered well down on the front and sides.

Mandibles horny, orange-yellow, darker at tips; facial area bright blue; irides brown; legs and feet brownish. Length, 680; bill from nostril, 36; wing, 317; tail, 223; tarsus, 73; middle toe and claw, 77 mm. The spurs are short, thick and stout, about 13 mm. in length. Often a spur is present on only one leg, the other being represented by a flattened nodule.

Adult Female.—Lores, chin and throat white. Crown, face and neck all around brownish black with a conspicuous V-shaped, subterminal, buff mark, while on the crown there is a small round spot farther down on the shaft. These coalesce on the lower hind neck, and on the mantle and upper back they form a well-marked, pale, rufous-buff shaft-stripe sending irregular, rather sparse mottlings over the remainder of the feather, which is a rich umber brown. On the lesser wing-coverts the rufous mottling becomes much more abundant, so that the dark colour is considerably reduced. On the longest coverts and inner secondaries we find the mottling reduced again and the rufous arranged in fairly regular transverse bars. The scapulars are dark brown, with slight, irregular, mottled barring on the outer web, even this disappearing on the primaries.

The mid-back to the tail-coverts inclusive is characterized by a grizzled grey coloration, a pale greyish-white background, very irregularly barred with dark brown, the shining white rhachis giving the effect of a white shaft-streak. The mottling becomes coarser posteriorly, so that the tail-coverts appear increasingly whiter. The rectrices are black with narrow, white, somewhat irregular bars, the central pairs showing lateral rufous mottling between the white bars, and all are broadly tipped with white.

Beginning abruptly on the upper breast we find the entire under plumage to be a uniform fine vermiculation of pale buff on a dull umber background, both colours however being about equal, giving a general olive tone. Posteriorly the vermiculations become somewhat coarser, and on the sides merge gradually into the colder grey, more coarsely patterned lower back and rump.

Spurs are visible, being mere flattened nodules. The measurements are: length, 630; bill from nostril, 30; wing, 280; tail, 185; tarsus, 71; middle toe and claw, 75 mm. Mandibles yellowish; legs and feet brown.

EARLY HISTORY

The first specimen ever recorded of this Impeyan was a live male bird. Of this Jerdon writes in the *Ibis* for 1870: "Another still more interesting species, brought alive from the Mishmi Hills, is a species of Monaul or *Lophophorus*. When I first saw it, it was in such wretched plumage that, although I considered it to be distinct from the Himalayan species, I was unable to describe it. It is now here at Shillong, on the Khasis Hills, alive and in good health, though not in my possession, and as it has very recently assumed its tail-feathers I am able to pronounce it decidedly distinct from *L. impeyanus*."

This very individual was later obtained by Mr. Jerdon and sent alive to the London zoo. It reached England on March 12, 1870, and lived for a year and eight months. Up to the present time this is the only record of Sclater's Impeyan in captivity. Jerdon tells us that the bird was very tame and fed readily from the hand. He fed it on rice and corn, and it was especially fond of lettuce and cabbage leaves. This type is now in the British Museum. It has lost almost all the iridescence from the mantle, back and coverts, owing to the excessive wear of the feathers. The general tone is now a dull, smoky black.

The female was described nine years later.

SYNONYMY

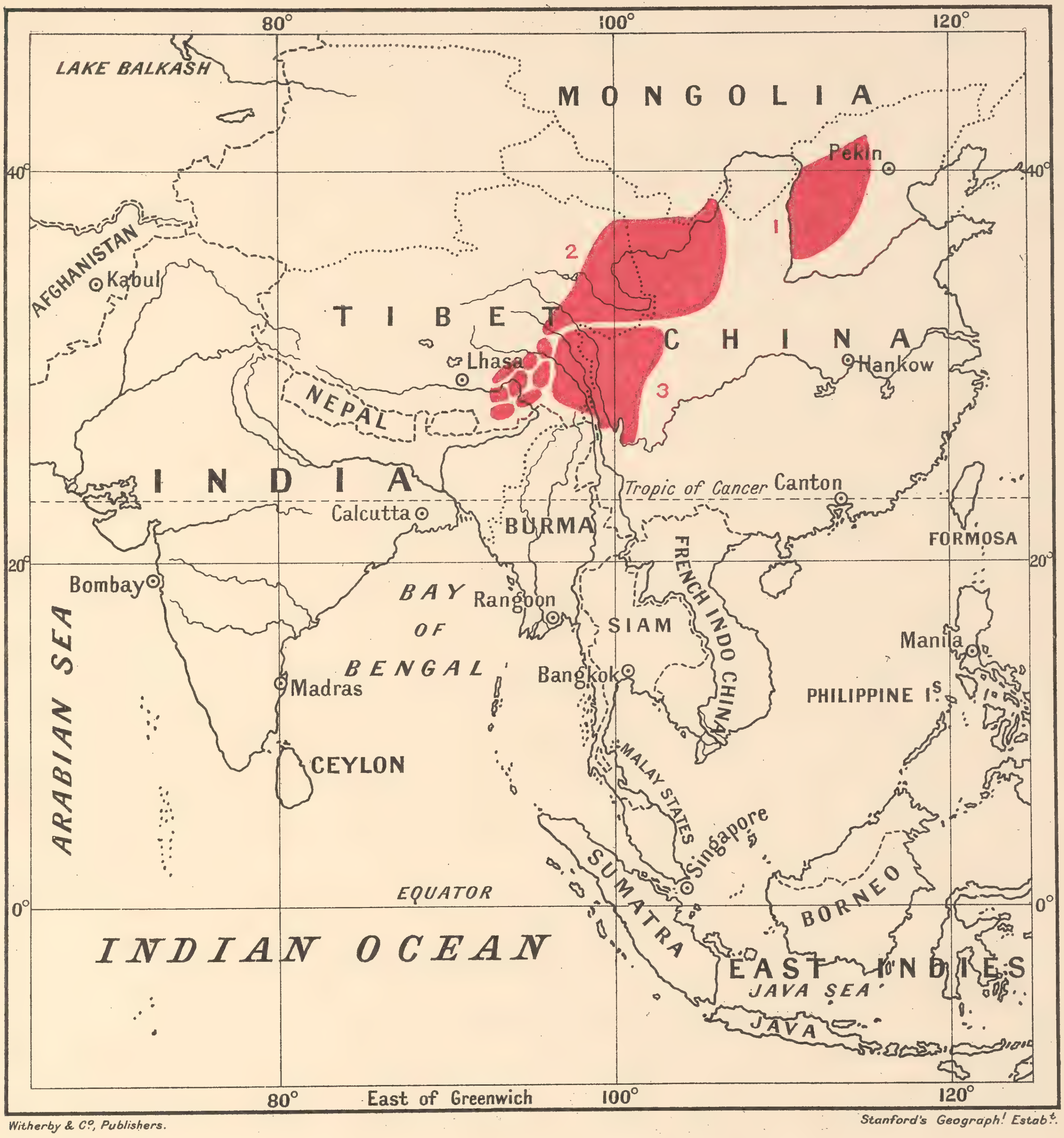
Lophophorus sclateri Jerdon, Ibis, 1870, p. 147; Jerdon, Proc. Asiatic Soc., Bengal, 1870, p. 61; Gray, Hand-list of Birds, 1870, p. 261; Sclater, Proc. Zool. Soc., 1870, p. 162; Elliot, Monogr. Phasi., I. 1872; Elwes, Proc. Zool. Soc., 1873, p. 660; Hume, Stray Feathers, II. 1874, p. 488; Hume, Game-birds of India, I. 1879, p. 135; Godwin-Austen, Proc. Zool. Soc., 1879, p. 681; Hume, Stray Feathers, XI. 1888, p. 301; Grant, Cat. Birds Brit. Mus., XXII. 1893, p. 282; Hartert, Ibis, 1894, p. 291; Grant, Hand-book Game-birds, I. 1895, p. 240; Mitchell, Proc. Zool. Soc., 1911, p. 521; Finn, Game-birds India and Asia, 1911, p. 36; Beebe, Zoologica, I. No. 15, 1914, p. 271.

Crestless Moonal Hume, Stray Feathers, IX. 1880, p. 203.

Chalcophasis sclateri Oates, Game-birds India, I. 1898, p. 269; Sharpe, Hand-list of Birds, 1899, p. 34.

CROSSOPTILON

EARED-PHEASANTS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MONGOLIA
Pekin
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AFGHANISTAN
Kabul
TIBET
CHINA
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Hankow
NEPAL
INDIA
Tropic of Cancer
Canton
Calcutta
BURMA
FORMOSA
20°
Bombay
BAY OF BENGAL
Rangoon
SIAM
FRENCH INDO CHINA
Manila
ARABIAN SEA
Madras
Bangkok
PHILIPPINE Is.
CEYLON
MALAY STATES
Singapore
SUMATRA
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EAST INDIES
JAVA SEA
JAVA
East of Greenwich

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MAP SHOWING THE DISTRIBUTION OF THE EARED-PHEASANTS.

Region	1.	Crossoptilon	mantchuricum.
„	2.	„	auritum.
„	3.	„	tibetanum.

CROSSOPTILON

EARED-PHEASANTS

FAMILY PHASIANIDAE

Subfamily PHASIANINAE

Genus CROSSOPTILON

EVEN more than *Catreus*, the present genus stands alone, removed by many characters from all others of the subfamily. Elliot considers it nearest to *Impeyanus* and *Pavo*, on account of the heavy mandibles and feet or the disintegration of plumage. Other authors place it after *Lobiophasis*, probably on account of the unusually large number of tail-feathers. Owing to the Phasianine mode of tail moult I have included it in this subfamily, but with the realization that only an actual tree-like classification, ramifying through the three planes of space, could show its real affinities. In any event, the Eared-pheasants are a most interesting group and well worthy of detailed study.

The Eared-pheasants are in general coloration brown, blue or white, with partly iridescent and semi-disintegrated tail-feathers. These are numerous, numbering twenty to twenty-four in the adult, all being large, broad, rounded, and the central ones drooping, with long, free webs, and twice as long as the outer pair.

The 1st primary is much shorter than the 2nd, which is equal in length to the 9th or 10th; the 5th or 6th is the longest of the series.

The top of the head is covered with short, soft, curly feathers, velvet-like in texture. The ear-coverts are much elongated, being produced into long, white, upward curved tufts of rather stiff feathers on each side of the head. The remainder of the plumage is dense, long, and rather hairy.

Sides of the face bare, reddish and covered with small papillae. The sexes are alike, except that the males possess a pair of short, stout spurs. The tarsus is considerably longer than the middle toe and claw.

The brownish hues of the immature birds are found in the adult plumage of one species, while in another this hue alters to a slate blue. This in turn is found to give way more and more to white until the acme of colour evolution is found in the almost pure white Tibetan Eared-pheasant.

CROSSOPTILON

	Type.
Crossoptilon Hodgson, Jour. Asiatic Soc., Bengal, VII. 1838, p. 864 . .	*C. tibetanum.*

There has been much bungling in the research work upon this group, due both to erroneous observation of skin characters and lack of comparison of specimens in various museums. There seems good reason for supposing that instead of five there are but three species, and two of these may ultimately prove to be related subspecifically.

The three forms, which are confined to the mountains and highlands of eastern and central China and Tibet, are as follows—

Brown Eared-pheasant	*Crossoptilon mantchuricum* Swinhoe.
Blue Eared-pheasant	„ *auritum* (Pall.).
White Eared-pheasant	„ *tibetanum* (Hodgs.).

The general colouring of brown, blue, and white will serve as a key to distinguish the three species, while the cocks possess stout spurs and the hens are spurless.

BROWN EARED-PHEASANT

Crossoptilon mantchuricum Swinhoe

NAMES.—Generic: *Crossoptilon*, from the Greek κροσσός fringe, and πτίλον down or feather, fringe-feathered, from the condition of the tail feathers. Specific: *mantchuricum*, from Manchuria, the supposed habitat of the first specimen described. English: Brown or Manchurian Eared-pheasant or Snow Pheasant. French: Faisan Oreillard. German: Mandschurischer Ohrfasan. Vernacular: Chao Chi (horned chicken—Shansi, Chinese), Ho-ky (Chili).

BRIEF DESCRIPTION.—Male: Crown feathers short, curly and black; elongated upturned ear-tufts white; neck black shading into brown on mantle; lower back and rump dirty white; breast blackish-brown, remaining under parts lighter; tail dirty white at base, the tips brownish, glossed with purplish-blue; a pair of short, stout spurs. Female: Similar, but without spurs.

TYPE.—"Tsin-tsin." Swinhoe, Proc. Zool. Soc., 1862, p. 286.

RANGE.—Extreme north-eastern China.

THE BIRD IN ITS HAUNTS

It is difficult to imagine a greater contrast than the haunts of the white-tailed pheasant of Borneo and the home of the Brown Eared-pheasant of north-eastern China. The one is found in the thick, steaming, tropical jungle, with the flash and song of brilliant birds and the never-ceasing hum of insects. Trailing vines and hanging lianas of the forest drape every vista; the scorching rays of the mid-day sun scarcely penetrate the denser foliage, where fragrant orchids and rich tinted leaves brighten the sombreness of the shadowy glades.

To turn to the antithesis, we pushed inland from the shore of the Yellow Sea, where we found a vast country, flat as a board. At once we missed the rice fields which, in all our pheasant searching, from Ceylon to Japan, had been so universal a sight whenever all traces of native occupation were left behind. Here the fields were ploughed and already at the end of March planted to millet, barley, and Indian corn. Before we could reach the haunts of the wild creatures we must traverse many miles of native-ridden country. The only trees in view were sparse, spindling saplings in rows, pitifully trimmed for fuel to the last possible twiglet compatible with life. 'Dobe houses brought Mexico vividly to mind, and houses, trees, burros, land, even the water, were all monochrome—dirt, mud or dust colour, and when the cold wind blew, the very air as well partook of this hue.

Although we realized that hordes of human beings were somewhere concealed within the horizontal circle, seldom did we see more than one or two Chinese at a time. Now and then a wheelbarrow with a small tattered sail meandered slowly along the distant levels. No roads were visible anywhere. The rare travellers, like ourselves, seemed to pick their away along the narrow boundaries of the fields. No fences, no high weeds or dead grass; only ploughed barrenness everywhere, with here and there a faint emerald mist in the furrows, half promising better things for the spring. Rarely was seen a great-wheeled cart, dragged laboriously over the furrowed fields by two animals tandem—a bullock, a burro, a mule, or a tiny, shaggy Mongolian pony as the case might be. Once, on the opposite side of a wide, muddy stream we saw a brace of pheasants, one a ring-neck and the other a Brown Eared-pheasant, dangling at the tail of such a cart. We knew that the latter was not found in this vicinity, so the bird must have been trapped elsewhere and brought here for sale. No shouts or gesticulations on the part either of ourselves or the interpreter were of any avail in arousing the huddled blue-garbed driver, and even when at last he condescended to glance in our direction, the waving and jangling of a string of "cash" had no effect whatever. He sank again into his formless, hunched position, and resumed what thoughts we shall never know—whatever thoughts any one of these countless millions of Mongolians may have.

From the thick, muddy lagoons and sluggish creeks ducks rose now and then—mallards, black, pintails, shovellers, and two kinds of teal. In the fields plover were occasionally seen, single magpies appeared, while spur-winged plover and lapwings flew before us in small flocks, or drifted with plaintive cries from one feeding-place to another. Rooks and crows were the most noticeable birds, and towards sunset I observed several hundred massing one by one, or arriving in small bands, in the centre of a field. Before we lost sight of them, all rose at once and flew eastward, doubtless to some roost, although how they could find any perching-place above the ground in this treeless, shrubless land was inconceivable. White-necked crows were in fewer numbers, flocking by themselves, although throughout the day they were constantly seen associating with their less conspicuous relations.

Always, everywhere, were the conical grave mounds, dotted to the horizon, many topped with a small stone. Twice from these a hoopoe flew past. Such was the life visible on the threshold of the Eared-pheasant country.

I was constantly impressed with the protection against the bitter winter cold which the creatures of this northern land showed. As our caravan proceeded slowly we passed ponies with long, shaggy coats; then a looped string of great Bactrian camels, supercilious and dignified, with dense fur trailing from their bellies and sides. The little burros were swathed in long, matted hair up to the very eyes, while, strangest sight of all, were the occasional giant black pigs with thick hair streaming almost to the ground, as unexpected a sight at first to our eyes as would have been a mammoth.

Leaving the outer region, we hastened onward, and one day entered a wholly different country. Instead of the cool air and bright sunshine of the preceding days there was a downpour of rain, cold and miserable. Only the long strings of camels seemed unaffected, and even their dignity was rather upset by the constant slipping and sliding of the great splay feet.

This day we travelled in palanquins, and a more miserable jaunt had not yet been recorded in our many thousand miles of adventuring. The country was cut up by flat river bottoms, covered with stones and small boulders of all colours, mostly flint and quartz. In the distance we could distinguish the barren mountains of Shansi, while near at hand the steep muddy banks which cut up the country in all directions gave a wild, rugged, most inhospitable appearance. Our bearers soon began to leave bloody

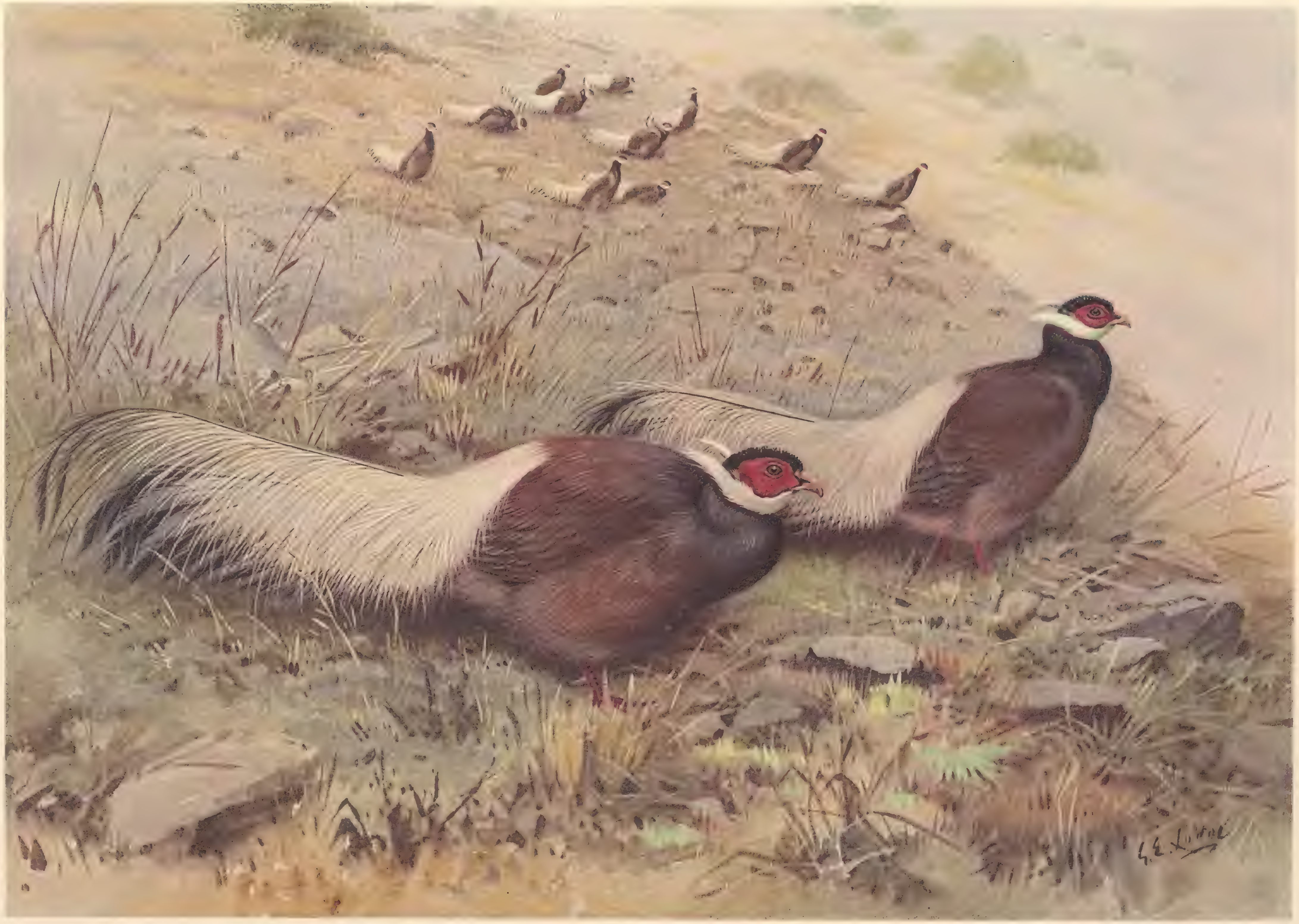
PLATE XVIII

BROWN EARED-PHEASANT

Crossoptilon mantchuricum Swinhoe

On a cold day in early April, on a tundra-like expanse far beyond Pekin, I watched this flock of Eared-Pheasants drift past. Around my umbrella tent, tiny voles appeared whenever the sun shone; buntings and wagtails dashed down for a few minutes, feeding; small, timid musk deer walked slowly downward toward the stream at the valley bottom. The pheasants fed as they moved, gathering about some tuft of grass and uprooting it with their stout beaks to search the loam for grubs and tubers. They did not suspect my presence, they uttered no sound, and in a few minutes they had passed out of my sight for ever.

PLATE XVIII



BROWN EARED-PHEASANT.

trails in the tracks of their flimsy straw sandals, for the vast areas of stones made cruel walking. Rarely, here and there, we saw a few spears of short brown grass, the only hint of any summer vegetation. Most strange always seemed the total lack of the remains of tall dead weeds, so common a sight in northern lands. In the afternoon the rain turned to snow, and although this melted at once on the rough, rocky country over which we had passed, yet before sunset we had a glimpse of the distant mountains, shining ivory white in the clear air. That night our camp was most miserable, cold and dreary, and we went to rest in our sleeping-bags to the wolfish howl of Mongolian dogs, thinking of the terrible ravages of the plague throughout all this region, of the hopeless disease which was only now dying out.

The next day brought us actually within the zone of life of the greatly desired Eared-pheasants, and after we began to ascend the outlying mountain slopes and passed little straggling villages built of stone, we began to feel the exhilaration of even these comparatively low elevations after the dreary monotony of the terrible endless plains. It was still a land of rocks and boulders, but here and there bright flowers of early spring gleamed in the calm frosty air. The lower mountains were monochrome save for a constantly increasing touch of green in the stems of the willows. The steep hillsides on the farther sides of the mountains were clothed with a beautiful golden russet mat of dead grass.

In days to come we left the boulder-strewn country behind and lived in a wilderness of scrub oak, pine and birch trees—all scraggly and dwarfed from the constant fight for life with the northern storms. One day's detailed observation will give a good idea of the haunts and neighbours of the Brown Eared-pheasant.

In a great sheltered valley, or rather in a deep niche cut out of one side, I watched one day in early April for what might come. Beyond the farther ridge and far down in the second valley was the camp. Before me was nothing but wilderness, stretching away unbroken to the farthest edge of the great land, with none but nomadic northern tribes of robbers to disturb the wild creatures, while behind was China with her teeming millions of half-starving human beings. I crouched, wrapped in a blanket within my cosy umbrella tent, with all the ventilation holes closed up, getting what warmth I could from the sunshine diluted through a zone of fleecy clouds. After setting up my little stand in many places I had had so far only the briefest glimpses of wild creatures, twice Eared-pheasants and several times small mammals. To-day I watched some little vole or shrew-like animals chasing one another from one grass tunnel to another within a few feet of where I was ensconced. They were veritable little weather vanes as regards the sunshine. When a dense cloud drifted across the face of the sun, all vanished as inexplicably as if dissolved in air; when the warm rays began to make shadows behind each rock, the tiny black forms began to flicker here and there, timidly at first, then more and more boldly. When the sunshine was really strong, as it became after the morning mist was completely dissipated, they became positively courageous, and one little chap clambered upon a stone at my very side, not four feet away, and made his toilet under my inspection. Every part of his tiny furry form was scratched and combed with the diminutive feet and claws, the little fellow sometimes fairly rolling over, doubled up into a round ball like a Japanese netsucke, as he worked with both fore feet at once. Finally he seemed satisfied and scampered off. When about to enter his tunnel, he hesitated a moment, glanced upward, and uttering a single faint squeak, dived headlong from view. Instantaneously all the others vanished, and none reappeared again. I tried my best to discover the cause of this sudden terror, but could not, and shall never know what sight or sound drove my small friends to cover. I doubt if they have the keenness of eyesight to detect a bird of prey while yet high in the air, at any such distance as birds are able to discern their enemy.

Some twenty minutes later my roaming eye fell upon a beautiful little form, standing a few feet outside the line of dwarf birches above and slightly down the valley from my niche. Three more musk deer soon followed and stood for a full minute staring at my low mound of canvas. But they soon seemed to accept it as a rather unusual boulder and began nosing among the grass stems and working gradually down hill.

I was intensely interested in the small deer, and watched their every movement until they passed from view. Nothing else appeared except now and then a magpie or a black-and-white wagtail which flew over. One of the latter alighted for a moment on a stone half-way down the hill and sang a few notes before drifting on towards the north. An hour later a flock of black-and-white-headed buntings dashed down around me, probably on migration, and for ten minutes fed on the ground, searching for seeds among the sparse grass stems, or singing in unison, four or five twittering sweetly at one time almost within reach of my hand. They were jolly, plump birds, and every day several such flocks would pass on their way, doubtless to breeding haunts far to the north in Siberia.

It was while the buntings were still about my tent, and just as my attention was drawn to a titmouse twittering among the nearest birches, that I saw the advance guard of a flock of Eared-pheasants. Buntings, titmouse, musk deer, all were forgotten, and I was filled with the old thrill of supreme joy at having accomplished the object which had brought me so far. They were even less suspicious than the musk deer, and hardly gave me a glance as they passed slowly within ten or twenty yards. Six came close together at first, then a group of ten, then three more, and I was keenly interested to observe that with these latter was a musk deer, keeping near but not actually among them. The other associations which I had recorded were at once brought to mind—the musk deer, laughing thrushes and the kaleege pheasants of Burma; the chevrotain and the white-tails of Borneo. The three groups of pheasants soon merged into a general flock, and the nineteen birds moved slowly past, giving me every possible opportunity for observation. Except when now and then I caught sight of the stout spurs on the sturdy legs, I could see no distinction between males and females.

As in so many other cases of plainly coloured pheasants, I was impressed with the remarkable protective colouring of the birds when they were perfectly motionless and the complete absence of that phenomenon when they moved so much as a leg, or gave even the slightest turn to the head or neck. As they passed away down the hillside this impression increased, and it was really most striking to see how completely the quiescent bird merged with its surroundings. The slope was dotted with boulders of all shapes, and the motionless pheasant became merely another such inanimate object, its colours of drab, brown and dingy white being those of the weathered, lichened rocks and dead grass.

When the flock passed through longish grass stubble, they stood higher, took slower steps and watched more carefully, the leaders taking hardly a mouthful of food, but concentrating their attention on the surrounding cover, very evidently on the lookout for some possible enemy hidden there. In the more open places this watchfulness was somewhat relaxed, although there was never a moment when several of the heads were not raised high, looking keenly for danger. In this particular I noticed that some were much more cautious than others. I at once leaped to the conclusion that these were the males, but a careful search with the glasses showed that this was not the case—there were as many watchful, nervous hens as cocks; so, unless the more hungry, less alert birds were the young of the year, not yet keyed up to adult discretion by total independence, I do not know, but from my observation on other pheasants I should say such was the case.

The mode of feeding was interesting. Several birds would gather about a tuft of grass and, with heads held on one side, would begin to work with strong, quick picks of the beak. The soil would fly, and now and then a bird would reach forward and seize something edible. Two or three times the efforts of the pheasants brought the grass tumbling down upon them, and then there was always a rush to get at the exposed roots, where an abundance of titbits seemed always to be present. Once a group of four birds was left far behind in their eagerness to deplete a particularly rich larder, and when they had finished they set out full speed and ran with great rapidity after their fellows. The single musk deer had meanwhile left his feathered companions and taken a more direct downward route, following closely in the trail of his four companions who had preceded him.

The birds were silent on this occasion, and uttered not a note while within sight. They were working obliquely downward, probably aiming eventually at the trickle of snow water at the bottom of the valley. I made no effort to go after them when they disappeared beyond a rise of ground, as I know that the first of the nineteen pairs of eyes to sight me would be the signal for the vanishing of the entire flock.

I waited an hour or two longer, but only one other episode of interest occurred, and that after I had crawled out of the tent and was stretching my cruelly cramped limbs. Swiftly and low over the maze of bare birch twigs came a tumultuous flock of slender-billed choughs, pursued by a white falcon of medium size. The bird of prey was in deadly earnest and made dash after dash at the frightened black birds, but for at least half a dozen swoops the choughs were too quick for him, eluding the sudden onrush by a single spasmodic swerve sideways, and then avoiding a second attack by rising above the falcon, forcing it to circle several times in order to gain altitude sufficient for another onslaught.

I retraced my way towards camp and found the southern slopes smoking in the last rays of the sun's warmth. When the sun sank and the chill shadow of night fell, this stopped at once, but, while it lasted, the mist was so dense that it seemed as if there was actually some subterranean combustion. I watched a rook grubbing in the centre of a yard or two of smoking soil, and this small area gave forth so dense a mist that the bird appeared dimly, like a mere faint shadow of itself.

GENERAL DISTRIBUTION

On the vaguest information, coming through several persons, Swinhoe, in his description of this species says, "If I am rightly informed our specimen hails from Mantchuria," and forthwith dubs it *mantchuricum*. Up to the present not a single individual has been authentically recorded as having been seen or collected in that country, nor is it ever brought in a frozen condition to the Pekin market by the Mongols—this fact in itself being quite good proof that the bird is absent from the region under question. The error, however, has been perpetrated in almost every allusion to the species in scientific and lay literature, since the first misstatement. I have therefore discarded the wholly incorrect common title of Manchurian, and shall call it simply the Brown Eared-pheasant, in contradistinction to the blue and the white species.

A summary of records shows that this species is found in the states of Chili and Shansi in the extreme north-east of China. In the former it occurs in the western half of the state, while it seems to be generally distributed throughout Shansi, its western limits thus being clearly marked by the Hoang-ho, and its probable northern boundary by the Great Wall of China.

GENERAL ACCOUNT

To sum up, I found the Brown Eared-pheasant in Shansi, inhabiting a bleak, rolling country, diversified by irregular mountains and in places with deep valleys which cut well down to the lower level of the outlying plains. Much of the country is barren and rocky, and here the vegetation consists of low woody shrubs and coarse grass. But wherever the soil and the shelter of a southern exposure permits, are sparse woods or occasional quite dense growths of pine and white birch, seldom higher than fifteen or twenty feet. Scrub oak is also common—seven to ten feet high and very gnarled and rugged.

From competent observers I learned that the Eared-pheasants are resident in regions such as this throughout the entire year—rambling about in flocks of ten to thirty birds during the winter, both in the groves and open slopes, and roosting in the woods. In spring they separate into pairs, those which seem to be old mated pairs going off quietly, hinting that there is apparently a tacit acceptance of the old tie continuing even during the winter flocking. I once watched a flock of five birds and observed a very evident division into two pairs, each couple keeping and working together. I never saw any attempt at fighting, but a sportsman who had shot a number while they were thus sparring said that these were invariably young birds. So it is probable that when the flocks break up in the spring, the young birds go off seeking mates and it is among these that most of the fighting occurs. Those who have witnessed such encounters say that they are rather tame affairs, and indeed, judging by the stoutness and the short character of the spurs, serious, bloody battles such as are waged by the firebacks are out of the question in the case of these northern pheasants.

While any very deep fall of snow would, of course, force the birds downward to lower levels, yet they are able to scratch or rather pick deep holes to reach the ground,

NORTHERN CHINA—THE HOME OF THE BROWN EARED-PHEASANT

The haunts of this bird are guarded neither by dense tropical jungles nor savage tribes, but by bleak, inhospitable wastes, where shelter and food are unknown. The sharp stones cut the feet of the palanquin bearers until the path is bloody. To find the birds themselves, one must leave all attendants behind and search day after day over the semi-barren tundras, hiding behind scrubby growths of vegetation to scan every rock and shadow.

The only inhabitants of this region are nomadic Tartars, whose sole possessions are their flocks of black-headed sheep. Now and then these wandering men bring a small herd to Pekin to exchange for the necessaries of life. Their fathers and grandfathers before them have done this selfsame thing, have followed the dim, stony trails which converge toward the old gateway in the Great Wall—until the path under the gateway has been worn smooth by the passing caravans of over twenty-one centuries. Now and then the most ragged of the shepherds will have the tail feather of an Eared-Pheasant stuck jauntily in his rough skin cap.

NORTHERN CHINA:- THE HOME OF THE BROWN-EARED PHEASANT

and I believe that the annual altitudinal migration is less than would be expected. Even in summer they are not found on the summits of the ranges, and I believe that throughout the year they can hold their own on the median levels. Where not persecuted they are not rare, and in a region which is uninhabited and seldom or never shot over, one may expect to find one or two flocks of considerable size within a day's search. This, of course, was more especially possible in my own case, where my only object was actual search for the pheasants. I have gone carefully over many miles of ideal Eared-pheasant country for two days at a time and seen nothing but several ring-necks, and, on the other hand, travelling in a straight line in the course of a single day I have counted as many as thirty-three birds divided into three flocks. This last is unusual, and wherever the birds are trapped or shot they soon become thinned out or exterminated, for they are attached to the limited region which they call home, and being naturally rather stupid and unwary it is not a difficult matter to kill an entire flock.

The sociability and gregariousness of Eared-pheasants is perhaps more pronounced than in any other species of this family. It is all the more conspicuous a trait from the comparative lack of masculine pugnaciousness, the chief cause of flock and family dissensions among gallinaceous birds. When several birds are kept in captivity in a runway, they are almost always seen close together. No one bird, either male or female, seems to take the lead, but there is seldom a moment when the trio or quartet of birds are more than a few feet apart. As we have seen, this characteristic is true of wild birds. They impress one as rather stupid birds on the whole, but extremely fond of one another's society in this land of desolate vistas and wild winters.

The flock which I have described in some detail was an exception in its silence; like most intensely gregarious creatures, Eared-pheasants are rather voluble; they are continually conversing in undertones, and in fact have as large an intonation vocabulary as our domestic fowls. I was once so hidden that I could not catch a glimpse of six of these pheasants after they had passed my observation tent. They were on a steep slope immediately beneath and hidden by a large projecting boulder, but I could hear every note and could detect contentment, peevishness, anger and alarm as readily as if I had been able to see the cause for each utterance.

The mating call which corresponds to the crow of other pheasants is uttered by males even after they have paired off, in this case, I presume, the call being more of a challenge, or a warning to possible rivals that the locality and mate are pre-empted. I have also heard it from members of a flock in early spring, both on the ground, on a rounded boulder, and from the branches of a low, straggling oak-tree. During the utterance the tail is moderately elevated, with the two central plumes raised well above the others, while the neck is stretched out, the bill pointing almost or quite straight upward. The call may be written *Trip—c-r-r-r-r-ah!* sometimes, as I have written it, cut off abruptly as a short, sharp, rolling phrase, or again drawn out to considerable length. One man described it as sounding like a cross between the note of a guinea-fowl and a peacock. When thus lengthened it is probably the full elaboration of the call, or perhaps the utterance of an adult male. It begins low and softly and increases rapidly in volume and loudness, continuing sometimes for a full sixty seconds, apparently without the bird drawing breath, although of this I cannot be sure. At any rate no break is detectable. In captive birds the longest duration which I have timed is fifteen seconds, and this only once. The cry is high and raucous, rather unpleasant to the ear. On the giving of this call by a bird in a flock, the others usually cease their feeding and listen, doubtless merely indicating the beginning of those instincts which later will cause the females to be attracted to the sound, and the unmated males to be aroused to accept the challenge. It is seldom or never heard in the middle of the day, but in spring is given during early morning and at dusk. Sportsmen who know this country at all seasons say they have never heard it in the summer, autumn or winter.

The content note is much like that of the common fowl, and this rather inarticulate sound when increased to a *wak! wak!* indicates suspicion or apprehension of danger. Unlike most pheasants, however, when alarmed or terrified to such an extent that the birds take suddenly to wing, I have never heard a note uttered, a most striking contrast to the frenzied squawks and screams to which most of the members of this family involuntarily give utterance at such a moment of extremity.

I believe without question that, except under the provocation of such an extremity of danger, Eared-pheasants never take to wing, except possibly to reach the branches of their roost. I shall have occasion to describe the flight more in detail when touching upon methods of escape. The usual gait is slow and dignified, and when several birds are slowly making their way through grass or around outjutting boulders, with their long, flowing tail-feathers held high, their movements are exceedingly graceful and pleasing. The curved, drooping tips of the longer feathers do away with all the alertness which characterizes the sharp-pointed tail of the ring-necked pheasant. The Eared-pheasants give the impression of self-confident, gentle creatures, masters of themselves, and with the problems of food and enemies well in hand. It may seem curious to read so much into a bird from the mere fact of its gait and general carriage; but if one will compare a captive *Crossoptilon* with a true *Phasianus*, the striking difference will at once be apparent.

In seeking its food, the Brown Eared-pheasant is essentially a digger or grubber, using for this purpose its large, strong, curved upper mandible. Its food, as a rule, consists of tubers, fine rootlets and insects. The second item is surprising to be recorded as a regular item of diet, but I found that in some of these rocky places the rootlets of the grasses seemed, at least in early spring, much more succulent than usual and certainly more than the old dried stems and leaves themselves. Whenever the birds are found in the vicinity of native hamlets or villages, they enjoy feeding on stray millet, barley and other grains. This is unusual, however, as the Eared-pheasants, with all their gentleness and unwary nature, are intolerant of the presence of mankind and leave such places almost universally to the ring-necked birds, which can live their lives within a short distance of a village, feed to repletion month after month on the sprouts or grain of man's culture and yet remain as wild and wary as the proverbial hawk. The Eared-pheasants are exceedingly omnivorous, and few succulent leaves, sprouts, buds, seeds or grains come amiss. I have found the crop of a bird crammed with acorns, many of which were still in their woody cups, while in the stomach proper, the tremendous muscular constrictions, aided by the small round pebbles and sharp sand, had comminuted earlier swallowed acorns to a mealy pulp. The Eared-pheasants, like the impeyans, probably never use the feet for scratching, the heavy body and short legs doubtless making the quick shifting of the centre of gravity not an easy matter. David records that "Three specimens killed in July had their crops filled with the leaves of *Cytisus;* while those procured in winter contained nuts, various kernels, leaves of mugwort, ferns and, above all, roots of orchids and other succulent plants, beetles, worms and caterpillars."

Water is an essential—apparently a daily requirement—and, unlike birds like the cheer, which are able to get along for extended periods without actually drinking from streams, these Chinese pheasants make a daily afternoon pilgrimage downward from the slopes to the pure, clear streams which intersect all the larger valleys and side ravines of such mountainous regions as Shansi. I have watched through high-power glasses a flock of about a dozen birds travel slowly down the opposite slope of the valley and, reaching the stream, spread out in a long line and drink deeply of the icy water. Then they turned and more steadily, with fewer desultory stops and side wanderings, retraced their steps upward toward the scrub, finally disappearing into the low forest of pines or birches, bound for some roosting-place which would place them as much as possible out of the reach of their terrestrial enemies.

I was never able to make certain that I had found a roost of these birds, but circumstantial evidence of plenty of sign, and clear indications that a number of large, heavy-bodied birds spent their nights in a small group of pines, and especially the fact that they reached the higher branches by leaps to successive branches, left little room for doubt that these pheasants were the occupiers of the roost. The pines were not over fifteen feet high, and until a grove of birches had shot up to windward they had evidently received the full force of the winters' gales and most of the branches were splayed out to the south-east, and on these the birds perched at night, protected from view by the dense foliage and by the height from enemies on the ground.

As I have said, the ring-necked pheasants inhabit the same region as those of which I am writing, but I never observed them in close proximity to one another, and as the former are seen singly or in small families and keep to the lower levels, there is small chance of any keen competition. As to the enemies of the Eared-pheasants, we may mention at least three mammals which probably take toll. These, in the order of their deadliness, are foxes, leopards, and wolves. The foxes, of which I had glimpses of two and saw abundant signs of others, should, logically, easily exterminate such large, heavy-bodied birds, and why they do not I could never even hazard a guess. The Eared-pheasants, passing through high, dense grass and scrub, surely offer most tempting lures for a fox or other creature lying in wait. And yet here are foxes far from rare, and here are the pheasants in fairly abundant numbers, and the solution of the problem is yet to be found. Leopards are almost as abundant as the foxes, although I saw only their tracks during my stay. The wolves are far rarer than either, but if a gang of these creatures started systematically to run down a pheasant it would seem not a difficult matter. However it is, the pheasants thrive in spite of their four-footed enemies; whether the foxes are content with the voles and hares, and the leopards and wolves with the roe and musk deer and the wild boars, I shall never know.

I saw no tragedy and only once observed the birds even threatened with danger. This was when an eagle appeared, soaring high over the opposite slope and apparently intent on some intended prey immediately beneath it. It showed three conspicuous white marks on each wing, one of which was a circular speculum in the centre of the wing, from which came their Chinese name meaning "Eagle of the Three Eyes." The

Eared-pheasants in the distance, which I was watching through my glass, saw the bird of prey long before I did and simultaneously squatted flat, showing their trust in their brown, dead grass coloration. As the eagle worked slowly away, they gained confidence and, still with bent legs and lowered head and tails, they crept into the nearest scrub and did not emerge until the dreaded one had disappeared. I was surprised, as I had not thought that such large, sturdy birds going in flocks would show such spontaneous fear. But those fierce northern wolves of the air—the gyrfalcons, and these great sea eagles are very evidently foes to be guarded against—enemies of the most dangerous character.

There is no doubt that the senses of sight and hearing are of equal importance to these pheasants—each becoming of preponderating value according to whether the birds are in the open or among the low, dense, scrubby undergrowth. Then the association with the musk deer is another asset—the addition of the sense of smell, which in birds is insignificant and defective in comparison with the two senses mentioned above.

The mode of escape of the Brown Eared-pheasant is most characteristic. I did not have the opportunity of seeing the birds attempt to evade the attack of a four-footed enemy, and the crouching at sight of the bird of prey would of course be used only in the case of similar aerial dangers. When I came suddenly upon a flock of these birds the result was always the same and, I take it, is that which occurs in the case of an attacking quadruped. The birds would usually be scattered irregularly over the rocky or grassy slope on the instant of my coming into view, but while there was never any alarm note uttered, every eye would seem to spy me at the same moment, and every bird would turn like a flash and, with a most surprising burst of speed, run *uphill.* Even when I came upon them from above, they merely ran along the slope for a short distance and then turned upward. At the rate they go, threading the dense thickets and dodging around the boulders, a fox or any such animal would find it no easy matter to catch one. We all know how swiftly a common pheasant can cover the ground, head and tail raised, legs moving so rapidly that they fairly make a blur of motion, and yet an Eared-pheasant could readily outrun the other species.

If I stood still for a while the birds would reach the summit with unabated speed and then, as I found by running swiftly after them, they would continue their cursorial flight down the opposite side, their brown forms and tossing tail plumes appearing for an instant here and there among the irregularities of the slope. But if I at once dashed in pursuit, and, although left far behind, yet showed them that I apparently intended to run them down, the sight which met my eyes when I pantingly reached the summit was wholly different. Every bird took off from the highest point, sprang into the air and began a long, scaling flight into the valley far below, or, if this was of a narrow, gorge-like formation, they aimed for the opposite slope. This flight was almost motionless as a rule, but now and then a bird which had not had sufficient initial impetus would begin to flap, and at once I realized what really poor fliers are these Eared-pheasants. Their wing-beats were laborious and irregular, they swung from side to side like an aeroplane without sufficient headway, and in no case was their flight prolonged beyond two hundred yards or thereabouts, while very often the birds came down within twenty or thirty yards, either taking a fresh start like a flying fish, or diving headlong into the undergrowth. The rounded wings are spread to their fullest extent, while the tail, on the contrary, is quite closed, except when the bird is about to alight. Every movement told of extreme exertion and unusual effort, and however much we may admire the carriage and gait of this pheasant on the ground, there is little to be said in praise of it when on the wing. I doubt if an Eared-pheasant is capable of flying uphill or even on a level. In spite of the heavy body, there is no hint of awkwardness when the bird is running at full speed. Each step seems a springing leap which carries the bird along at a steady, ostrich-like gait, entirely unlike the awkward half amble with which these pheasants in captivity will often run towards their food.

When we come to know the relative amount of trust which birds put in their protective colouring ; when we compare the exact methods of escape, one with another, all these instinctive habits will be of greater value in judging of the dangers and correlating the effect upon their form and plumage of the various factors in their environment than all the theorizing which we can bring to bear upon the subject.

The Brown Eared-pheasant is monogamous, and in early spring the flocks, as I have said, break up into pairs of mated birds. I have already spoken of the casual fighting among the males, and in captivity I have noticed that in sidling up to their keeper, preparing to attack him, as certain irritable individuals sometimes will, they go through a lateral display which very probably also characterizes their courtship. The nearest wing is lowered, the opposite raised, while the tail is spread wider than I have seen it at any other time, and is very clearly the principal object of display or intimidation, as the case may be.

The nest is invariably placed in the shelter of the pine or birch woods, and is truly pheasant-like, a mere hollow in the ground or among dead leaves. Several natives independently gave me five to eight as the number of eggs, and I am inclined to accept this as correct. The eggs and young I have treated under the birds in captivity.

RELATION TO MANKIND

The Brown Eared-pheasant is no lover of mankind or his habitations, and though not refusing to make an occasional meal from a grain-field of barley or millet, when the occasion offers, yet these birds are seldom found in the immediate vicinity of Chinese villages or even isolated farms. Among the Chinese there has been in the past little demand for the flesh of this or other birds, and even the hungry Caucasian finds little joy in the rather tough, and exceedingly stringy flesh. Young birds are better eating, but in any case the bird is far inferior to the ring-necked pheasant as a dish for the table. This is doubtless due in part to its diet, for the flesh of a captive bird, which has been fed on grain for some time, is as delicate as that of any pheasant. In many places where it was formerly abundant, however, it has now been exterminated, owing both to a newly acquired desire for a meat diet on the part of many Chinese and because of the destruction of the woods in which it nests and roosts, and in which it found safety from pursuing enemies. David, as long ago as 1877, voiced much the same sentiments, and to-day all the Eared-pheasants which approach the haunts of man have but short shrift, their size and regular habits rendering them an easy prey to the Chinese pot-hunter. They have, of course, no legal protection at any season of the year, nor if they had would it be of any avail in this land of superstition and ignorance. The loose flowing central tail-feathers of the Brown Eared-pheasant are stated to have been formerly worn by Tartar warriors. At the present day there is not nearly so great a demand for these feathers in Pekin and northern China as in central and western China, where the blue species of *Crossoptilon* is sought eagerly for these ornamental plumes.

CAPTIVITY

The bird was first received at the Zoological Gardens in London, and the Jardin d'Acclimatation of Paris about the year 1864. During the following few years a considerable number were bred in Europe, four recorded hatchings numbering respectively seven, nine, ten and eight chicks. Over one hundred were reared in 1868, and twice that number in 1869 by various amateurs. For a time hopes were entertained of reproducing this bird in large numbers. In 1871 the result of these expectations is summed up as follows, the author referring to specimens in the London Zoological Gardens: "As regards our living specimens, I regret to say that our hopes of introducing this fine bird permanently into Europe appear likely to be miserably disappointed. Nearly all those in our Gardens, both introduced and bred, alike have sickened and died, and at the present moment we are left with two females only. In most of the continental gardens, so far as I can make out, nearly the same event has taken place." In 1866 the price for a single pair was $400. Four years later it had fallen to $100.

Of twenty individuals which have been kept in the London Gardens, one has a record of three years and a half. The average longevity, however, is less than two years—to be exact, twenty-two and a half months.

The shortness of life in captivity of these birds is all the more regrettable because of their remarkable *penchant* for domesticity. This almost equals the domesticability of the red junglefowl and mallard duck. The chicks show absolutely no fear of man and are always running over one's shoes or plucking at the clothing of their keeper. Now and then an individual will be found which is of an irascible disposition and always ready to attack one's ankles with beak and occasionally with spurs, but this is a rare exception. Usually Brown Eared-pheasants are most amiable and quiet, and in a very short time will come up without fear and take food from one's hand, murmuring contentedly to themselves. While the flesh is not particularly good eating, and the habits of the birds are far from appealing to the desires of a sportsman, yet the birds are exceedingly graceful and of great interest, and would be a worthy addition to any estate or aviary. As it is, their reproduction in captivity in any numbers is not possible, and their continued existence on the earth will depend on some part of their rather restricted range being conserved before it is too late.

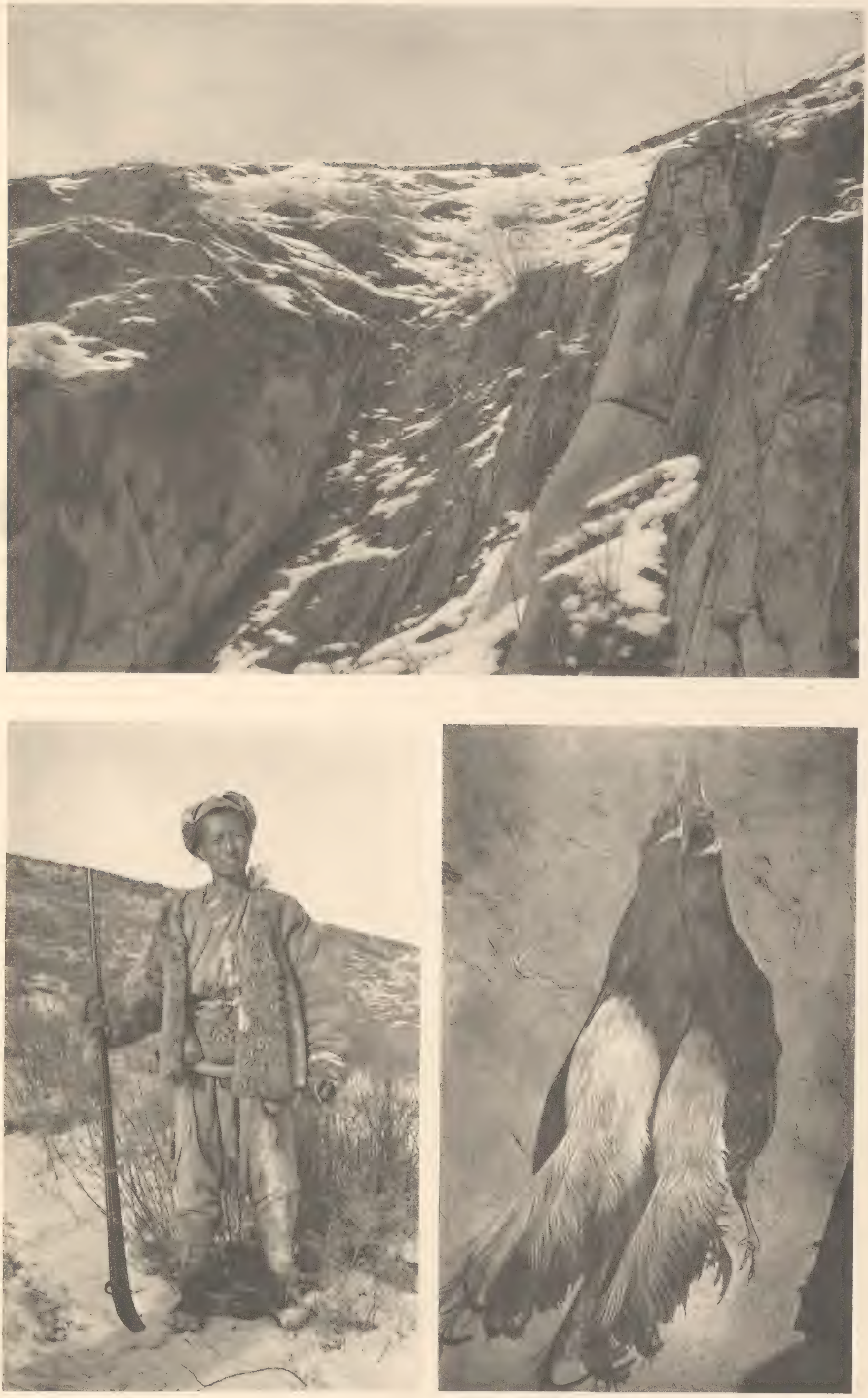
In captivity the hens lay from twelve to sixteen eggs, indeed forty-one have been obtained from two pairs of birds. I believe, however, that this is a much greater number than the normal nest complement. Six to eight is probably the more usual number. The period of incubation is between twenty-eight and thirty days, and the only hint we have as to division of labour between the sexes is the statement that in captivity the

PHOTOGRAVURE 14

THE HAUNTS AND THE HUNTERS OF THE BROWN EARED-PHEASANT

A THOUSAND photographs of the home of this bird would seem to be nothing more than pictures of the same place. There is nothing more to be seen than coarse grass and straggling weeds, touched by scattered flowers in the spring, and covered lightly by drifting snow in the early autumn. The bare rocks are lichened and have become the colour of half-frozen soil. In such an environment the Eared-Pheasant lives happily and holds its own even against the Chinese pot-hunter, the circling eagles and the stealthy leopards. With antiquated gun but Oriental patience, the Mongol hunter pursues his game and never misses. Only the vast extent of these desert regions and the wandering habits of the birds have saved them from complete extinction.

PHOTOGRAVURE PLATE 14



THE HAUNTS AND THE HUNTER OF THE BROWN-EARED PHEASANT

male takes no part in incubation. As in captivity the eggs are usually hatched under a domestic fowl, this requires more careful observation. The cock certainly does his full share afterwards, however, and in a wild state both parents are seen constantly together with their brood, sharing the finding of food and guardianship. The chicks, as I have said, are remarkably tame, and the sexes are, as in the adults, almost indistinguishable. They attain adult plumage at the first annual moult, and will breed when a year old. The eggs are rather small for the size of the bird, of a regular oval form, with but little gloss and of a pale stone-colour. They average 53 × 39 mm.

A French amateur makes the following statements which have as yet been unconfirmed by other writers. The male Eared-pheasant prepares the hollow in the grass which will contain the eggs, by digging the turf with his beak. The eggs are laid every two days. After they are deposited he takes his place alongside and, plucking blades of grass, covers the eggs thickly, hiding them completely from view. Six months after hatching the birds are full sized and in adult plumage.

The narrow quarters, often necessarily brick or cement floored, in which these birds are usually kept, together with their diet of hard, dry grain, probably has much to do with their short life. The chicks die of gapes and other diseases common to fowls, and the adults usually succumb to enteritis or liver disease, while the unnatural diet often leads to confirmed feather-eating, when they will completely devour one another's tails if not separated or given proper food. If they were given a large natural enclosure with trees, underbrush, grass and a stream of clear water, the results might be much more encouraging. A supply of lettuce and cabbage in the winter and some form of insect food at that season ought to complete an ideal *régime*. Our trying climate of the north temperate zone is probably only an indirect cause of death, for the damp, cold winds and bitter storms which sweep across the mountains of northern China are fully as unbearable.

Near New York, Brown Eared-pheasants have been successfully reared on a diet of hard-boiled eggs, ants' eggs, elder- and blackberries, boiled rice, hemp-seed and other grain as they grow older. They are very fond of beetle-grubs, but will not touch the common red earthworms.

TEXT IDENTIFICATIONS

PAGE	LINE		
163	14	White-tailed Wattled Pheasant	*Lobiophasis bulweri* Sharpe.
164	15	Mallard Duck	*Anas platyrhynchos* Linn.
164	15	Black Duck	*Polionetta zonorhyncha* (Swinh.).
164	15	Pintail Duck	*Dafila acuta* (Linn.).
164	15	Shoveller Duck	*Spatula clypeata* (Linn.),
164	15	Teal	*Nettion crecca* (Linn.).
164	16	Magpie	*Pica pica sericea* Gould.
164	16	Lapwing	*Vanellus vanellus* (Linn.).
164	18	Chinese Rook	*Trypanocorax frugilegus pastinator* (Gould).
164	18	Oriental Crow	*Corvus corone orientalis* Eversm.
164	22	White-necked Crow	*Corvus torquatus* Less.
164	26	Hoopoe	*Upupa epops saturata* Lonnb.
165	33	Vole	*Microtus* sp.
166	14	Black-and-White Wagtail	*Motacilla alba leucopsis* Gould.
166	16	Black-and-White-Headed Bunting	*Emberiza leucocephala* Gmel.
167	31	Chough	*Pyrrhocorax pyrrhocorax* (Linn.).
167	31	White Falcon	*Falco cherrug milvipes* Jerd.
171	29	Himalayan Grey Fox	*Vulpes alopex montanus* Pears.
171	42	Chinese Sea-Eagle	*Circaëtus hypoleucus* (Pall.),

DETAILED DESCRIPTION

Adult Male.—Entire top of the head covered with a dense growth of short, velvety feathers, black and recurved, large bare facial areas scarlet, covered with small papillæ. Featherlets just behind nostrils, chin, throat and the feathers below bare facial area, creamy white; the much elongated and stiffened ear-coverts glistening silvery white. These latter are directed upward and extend clear of the plumage on each side of the head as two oblique tufts or "ears." Occiput and the neck all around glossy black. The anterior rows of occipital feathers have whitish median and basal areas, and the abrupt line of recurved crown feathers brings these parts into view, resulting in the appearance of a very narrow, more or less distinct transverse line of dull white at this junction.

On the upper plumage the black neck shades gradually into brown on the lower mantle and wings, all the visible portions of the feathers being loose and hairy owing to the abrupt shortening of the barbules and the disappearance of the barbicels on the entire distal half of the vane. Even on the basal portion the latter are few and afford little cohesive strength to the web. The wing-coverts are somewhat firm in texture, but even the secondaries and primaries are much softer and more pliable than in most pheasants. The wing-coverts and secondaries are quite strongly glossed with purple, while the inner webs of the primaries show an equally strong sheen of bluish. The lower back, rump and upper tail-coverts are a dull, silvery white; the former area rather stained with traces of the dorsal brown.

On the ventral surface the black neck shades into the brown of the remaining under plumage. The flanks and under tail-coverts are somewhat paler brown than the surrounding feathers.

The tail is the especial glory of this rather sombre-coloured pheasant, and consists of twenty-two feathers. It is strongly graduated, the central feathers being two and a half times as long as the outer ones. By far the larger portion of the feather is a dull white, becoming stained with brownish towards the tip. The terminal portion is brownish black glossed with rich purplish-blue. The two outer pairs are quite compactly webbed, but from the third inwards, the outer web shows a disintegration of the barbs, which at the same time become elongated and curved. This increases until in the third from the central pair, while the inner web is quite firm, the outer web at a corresponding level on the feather shows filamentous barbs four times the length of those on the opposite side of the shaft. The two central pairs of tail-feathers in the adult male are almost wholly filamentous, the barbs draping the entire tail when this is closed. Even in these, however, there is a small spatulate tip of compact purple. In the usual position, the tail-feathers are held in two rather vertical lines, and these central disintegrated pairs are almost always raised considerably above the others. The extremities of the four inner pairs are sharply depressed.

In a considerable proportion of male birds there is a pronounced tendency for white to appear in the wings. The bases of the primaries are often clear or mottled white, and the outer webs of the same feathers are sometimes very conspicuously vermiculated or mottled with the same colour. It is not unusual for most of the feathers of the under surface to show a distinct terminal band of white. There is also much variation in the relative proportion of black and brown in the plumage, the glossy black occasionally predominating and giving the impression of a jet-black pheasant. This is somewhat, but only to a small extent, due to wear, the plumage just before moult being slightly paler than in the freshly moulted bird.

Bare facial area, legs, feet and spurs scarlet; bill light reddish horn colour; claws horn colour; eyes pale reddish-brown. Length, 1000; bill from nostril, 27; wing, 306; tail, 544; tarsus, 100; middle toe and claw, 75 mm. Spurs stout, strong and conical in shape, 10 to 13 mm.

ADULT FEMALE.—There is no decided difference in colour between the males and females, but the latter are appreciably smaller in size. Bill from nostril, 26; wing, 290; tail, 520; tarsus, 94; middle toe and claw, 73 mm. The spurs are scarcely noticeable in the females, being sharp, but very short scalules.

NATAL DOWN.—Crown and face dull yellowish buff; occiput and nape with a patch of rufous, extending down the hind neck as a darker stripe, and broadening out over the upper service as rufous much mixed with black. Two lateral, creamy-white stripes extend from the shoulders to the down of the tail. A dark chocolate-brown stripe is drawn obliquely backward from the orbit, across the ear-coverts, ending in an enlarged patch on the side neck, not joining the nuchal stripe. Chin and throat creamy white.

The smaller scapulars as seen when they are first sprouting are rufous, with pale buff tips, and a large, round, brown ocellus on each web. The primaries are for the most part dull brown with whitish tips and a few buff spots near the end. The secondaries (what can be seen of them at this early age) are pale brown, barred with buff and white. Seven primaries grow rapidly from the first, the longest being over 37 mm. out of the sheath at the time when No. 8 is still ensheathed, and No. 9 is a minute papilla. The secondaries grade off gradually, the 8th and 9th being very tiny, only a little way out of the sheaths. Bill from nostril, 9; wing, 63; tail, just appearing; tarsus, 33; middle toe and claw, 25 mm.

YOUNG FEMALE.—A rather young female shows that the post-juvenile plumage is uniform brown from crown to back, and with the white ear-tufts very small. The entire under parts are also brown in colour like the wings of the adult. Wings and tail like the adult, but the tail shorter and of a more impure brownish white.

EARLY HISTORY

In 1862 Swinhoe exhibited the skin of a female Brown Eared-pheasant which had been sent to him from Tsin-tsin by a Dr. Lamprey. After much vague theorizing and circumlocution he decides it is not *auritum*, although that supposition forms the title of his paper, and he names it *mantchuricum*.

Except for a decade of confusion with the Blue Eared-pheasant, *auritum*, the synonomy of this species is almost free from error.

SYNONYMY

Crossoptilon tibetanum Lamprey (nec Hodgs.), Proc. Zool. Soc., 1862, p. 221.

Crossoptilon auritum sive *mantchuricum* Swinhoe, Proc. Zool. Soc., 1862, p. 286; Swinhoe, Proc. Zool. Soc., 1863, p. 306 [Manchuria].

Crossoptilon auritum Sclater, List of Phas., 1863, p. 6, pl. 5 [Manchuria]; Milne-Edward, N. Arch. Mus. Bull., I. 1865, p. 12, pl. 1, figs. 1 and 2 [E. of Pekin]; Sclater, Proc. Zool. Soc., 1866, p. 418; Saurin, Proc. Zool. Soc., 1866, p. 437 [Mts. N.W. of Pekin]; David, N. Arch. Mus. Bull., III. 1867, p. 37 [San-Yu]; Bartlett, Proc. Zool. Soc., 1868, p. 115; Saint-Hilaire, Bull. Soc. d'Acclim., (2), VII. 1870, p. 135 [breeding in captivity]; Gould, Birds Asia, VII. 1870, pl. 22.

Crossoptilon mantchuricum Swinhoe, Proc. Zool. Soc., 1863, p. 306; Newton, Ibis, 1865, p. 361 [Pekin] Gray, List Gallinae Brit. Mus., 1867, p. 31; id. Hand-list Birds, II. 1870, p. 259; David, N. Arch. Mus. Bull., VII. 1871, p. 11 [Pekin]; Swinhoe, Proc. Zool. Soc., 1871, p. 399; Sclater, Proc. Zool. Soc., 1871, p. 495; Mairet, Bull. Soc. d'Acclim., 1871, p. 594; Elliot, Mon. Phas., I. 1872, pl. 16: Cornély, Bull. Soc. d'Acclim., 1874, p. 168; David and Oustalet, Ois. Chine, 1877, p. 405, pl. 106 [Mts. of Pechili]; Sclater, Proc. Zool. Soc., 1879, p. 118, pl. VIII. fig. 5; Garrod, Proc. Zool. Soc., 1879, p. 373; Sclater, List Animals in Zool. Soc. Gardens, 1883, p. 477; Evans, Ibis, 1891, p. 76; Grant, Cat. Game-birds, XXII. 1893, p. 294; Tegetmeier, Pheasants, 1904, p. 228; Rothschild, Bull. Brit. Orn. Club, XIV. 1904, p. 58; Mitchell, Proc. Zool. Soc., 1911, p. 521; Beebe, Zoologica, I. No. 15, 1914, p. 275; Baker, Jour. Bomb. Nat. His. Soc., XXIV. 1916, p. 636.

Crossoptilon Lavison, Bull. Soc. d'Acclim., XI. 1854, p. 718 [first arrival at the Jardin des Plantes].

Crossoptilon manchuricum Seebohm, Bull. Brit. Orn. Club, I. 1892, p. 18; Grant, Hand-book Game-birds, I. 1895, p. 254; Goodchild, Bird Notes, IV. 1905, p. 65; Finn, Game-birds India and Asia, 1911, p. 84.

Crossoptilum manchuricum Sharpe, Hand-list Birds, I. 1899, p. 35; Oates, Cat. Eggs Brit. Mus., I. 1901, p. 53; Lanning, Wild Life in China, 1911, p. 112.

Crossoptilum mantchuricum Dresser, Manual Palae. Birds, II. 1903, p. 672; Ingram, Ibis, 1909, p. 462.

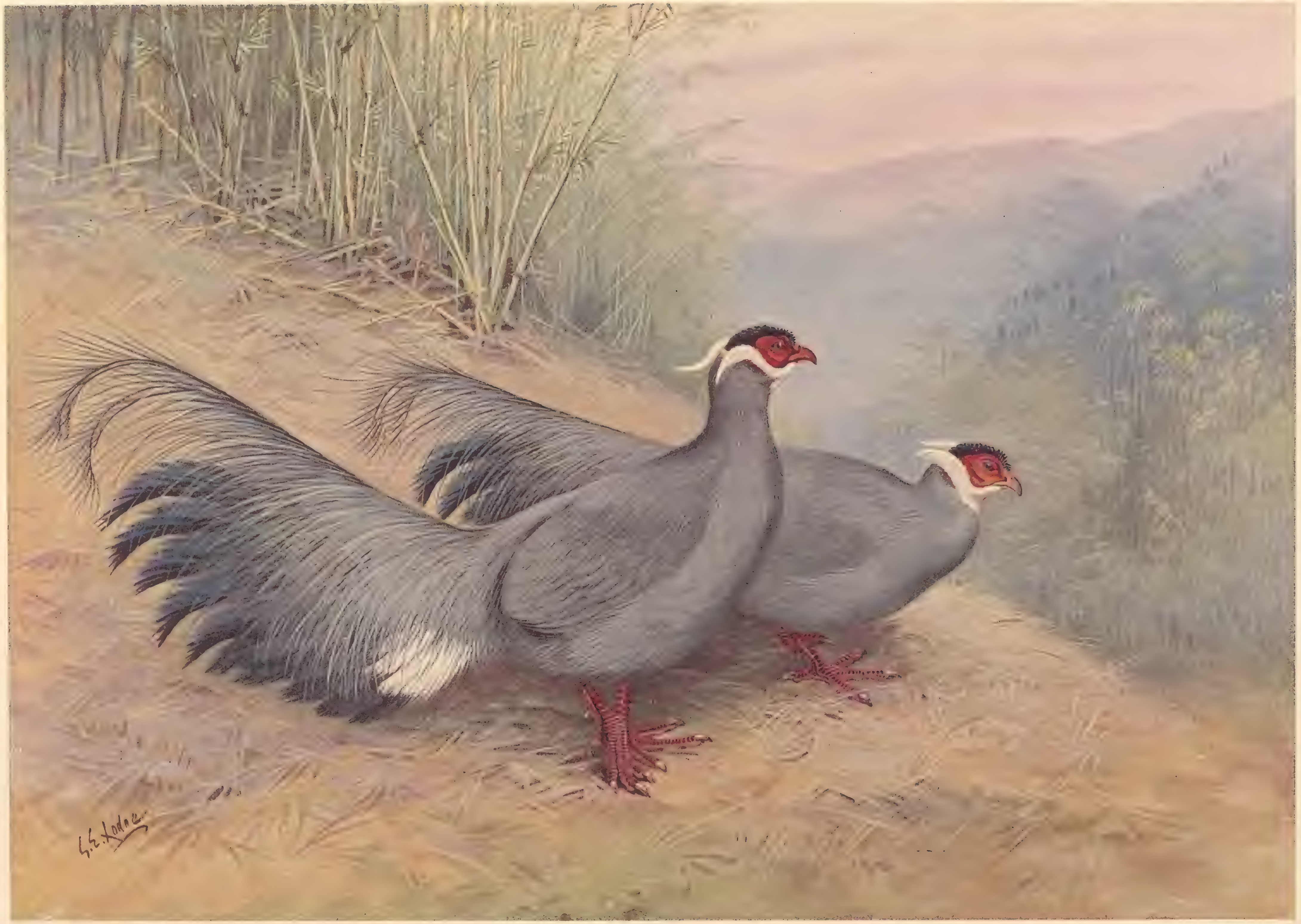
PLATE XIX

BLUE EARED-PHEASANT

Crossoptilon auritum (Pallas)

THE mountain slopes of north-eastern Tibet, with their larch, cedar and birch woods, are the roosting places of these birds, which by day come out into more open zones where growths of low bamboo, rhododendron, hawthorn and wild rose afford protection for their nests. The Chinese farmers set traps innumerable, for the central tail feather of the Eared-Pheasant is the badge of authority for the military leaders and therefore brings a high price. Year by year the birds are becoming rarer and it is not likely that they can hold their own for a much longer period. They live in pairs during the summer, but in autumn unite in good-sized flocks. When the snows come, these work downward into the lower valleys and roost close together among the upper branches of the tallest trees.

PLATE XIX



BLUE EARED-PHEASANT.

BLUE EARED-PHEASANT

Crossoptilon auritum (Pallas).

NAMES.—Specific: *auritum*, L. auritus, eared, from the elongated ear-coverts on each side of the head. English: Blue or Pallas's Eared-pheasant; Snow Pheasant; Grey or Mongolian Crossoptilon. French: Faisan de Mongolie; Ho-Ki. German: Mongolischer Ohrfasan. Vernacular: Ma-chi (horse-fowl, perhaps from its great swiftness of foot; Szechuan); Shandgi (mountain fowl, northern Chinese); Hara-takia (black fowl, Mongols); Shariama (Tanguts); Ho-ki.

BRIEF DESCRIPTION.—Male: General colour slaty-blue; crown feathers short, curly and black; ear-coverts, white and much elongated; an indistinct, white occipital band; chin and throat white; tail of twenty-four feathers, the outer pairs with the basal three-quarters white and the ends black glossed with purple. Stout, short spurs. Female: Similar to the male, except of somewhat smaller size and without spurs.

TYPE.—"Phasianus auritus," Pallas, 1811, Zoographia Rosso-Asiatica.

RANGE.—The mountains of Kokonor, Kansu, eastern Tibet and north-western Szechuan, western China.

I WAS not fortunate enough to be able to study the Blue Eared-pheasant in its wild haunts, and so am compelled to give a summary of existing knowledge of the habits of the bird as gleaned from ornithological literature, as well as some very interesting information sent to me by explorers and collectors. While this is extremely meagre, yet on the whole the facts point to habits and a general life-history almost identical with those of the brown eared-pheasant.

GENERAL DISTRIBUTION

This Eared-pheasant has been recorded from the states of Kokonor, Kansu and north-western Szechuan in western China, and from various localities in eastern Tibet. The Ala-shan mountains in upper Kansu form its northern boundary. It has been reported as far south as Sungpan in Szechuan, where it either touches or approaches very closely the northern range of the white eared-pheasant. To the south-east typical specimens have been found for some distance, beyond which the birds known as *harmani* are found, which in variability and general asymmetry of pattern and colouring demonstrate hybridization with the white species *tibetanum*.

GENERAL ACCOUNT

Lieut.-Col. Prjewalsky has had excellent opportunities of observing the Blue Eared-pheasant in the Tangut country, and found it both on the Kansu and Ala-shan mountains, where it was well known to the natives. He tells us that in both these localities this Pheasant lives in well-wooded regions, the forests of the mountain slopes, and never on the treeless ranges. It prefers the woods on the sides of rocky mountains, where there is an abundance of underwood, and in such places ranges up to an elevation of ten thousand feet.

The Blue Eared-pheasant is a resident, and in some places remains all the year within a comparatively limited area. Although the other species of Crossoptilon seem to repair daily to some stream of water, this bird seems less dependent on a regular supply, and in the Ala-shan mountains it is found in certain localities where not a drop of water could be procured.

It feeds almost exclusively on vegetable matter, and an examination of several crops revealed nothing but the buds and leaves of the barberry, stems and roots of young grass and various kinds of herbs. While feeding it is both graceful and stately, its tail being held straight out and quite high.

In the late autumn and winter the Eared-pheasants collect in small flocks, several families together, and are occasionally seen in the daytime perching on trees, doubtless feeding on the leaf-buds. During the warmer seasons of the year, on the contrary, they seem never to feed on trees, remaining constantly on the ground, grubbing in the earth for roots and succulent bulbs, and repairing to the branches only at night to roost.

Early in the spring the pheasants separate into pairs, and at this period the males begin to crow—challenging or calling to their mates. The natives say that the males fight with one another at this time. During the breeding season, the males have no regular crow, uttered at frequent and long-continued intervals, like the common pheasant, but they call only occasionally, rarely at midday or during the day, but generally soon after sunrise, although sometimes before daybreak. In any event the call is rarely heard, and an individual seems to repeat its cry only five or six times altogether.

The crow is loud and disagreeable, apparently somewhat like the note of a peacock. The voice of the hen is equally harsh and discordant. Peculiar deep notes are sometimes heard, having somewhat the quality of the cooing of doves, and when the Pheasants are startled their cry is like that of a guineafowl.

When the birds have paired off they keep to that part of the forest where the undergrowth is very dense, and here they make their nests and rear their young. The females are all sitting on eggs about the beginning or middle of May, the number of which, according to many statements of the natives, varies from five to seven.

Three fresh eggs were obtained by Prjewalsky from a local sportsman in Kansu, which had been taken from the nest after the female was shot. These resemble rather closely the eggs of the common fowl, but are very smooth and of a pale olive-green colour, without any spots. They measure 55 mm. in length, by 41 in breadth.

After the breeding season is past, the males at once commence moulting and attain their fresh plumage in October. Generally their feathers appear much worn, perhaps due to the constant attrition of the underbrush in which they live. They are in perfect plumage only during the winter and early spring. No young birds have been observed, but the Tanguts say that the chicks are invariably accompanied by both parents. The old as well as the young birds are very rapid runners, and the latter are also very clever at hiding themselves among the thick bushes when pursued. In fact, they depend almost wholly upon their legs, and seldom upon their wings, for means of escape. In describing two new species of titmice, Prjewalsky remarks that their nests are lined with the down feathers of the Blue Eared-pheasant.

Elliot quotes a letter from Abbé David relating to this pheasant, as follows: "Like its allies it frequents the woods of the high mountains, living more upon herbs, the leaves of trees, and succulent roots than upon grain; its nature is gentle and sociable; it loves to go in large flocks, like the White Crossoptilon of Tibet and the one from Pekin. It does not migrate, but passes the greater part of the winter lower down the mountains. Like the Crossoptilon from Pekin, which disappears on the destruction of the woods, the Blue Crossoptilon is diminishing rapidly from the chase carried on by the mountaineers (called *mauze*) in order to obtain the beautiful central feathers of the tail, with long webs and metallic colours, which are sold to the Chinese, whose military chiefs wear them as ornaments suspended from their hats."

An excellent observer, who has spent many years in the haunts of the Blue Eared-pheasant, tells me it lives at elevations of eight to thirteen thousand feet in pine, larch, cedar and birch forest, where there is a good deal of undergrowth. From here it frequently wanders out on to grassy slopes to feed, and, contrary to the observation of Prjewalsky, very regularly goes to streams in the side ravines or gorges to drink. Whenever it happens to come upon cultivated patches at high levels it will readily eat the grain, whether oats, buckwheat, corn, wheat, barley, beans or peas. It never causes any great injury, but is content with the fallen grains, and only too often pays for such a feast with its life. The birds feed usually in early morning soon after sunrise and again in the late afternoon. The middle of the day is spent in the shade of the forest trees, or else the birds may be found in the heat of the sun vigorously dusting themselves. The flight is no different from the more eastern species, and the mode of escape by running uphill, and when hard pressed taking to wing from the highest point, is also identical.

The trees of this region reach a much greater size than those of the north-east, and the pheasants are consequently able to roost much higher, and it is true that they select branches for this purpose well up toward the summit. Whole families and even flocks, as I have remarked, roost close together in the autumn and winter.

The eggs are laid in May or early June, and the chicks, which emerge a month later, usually number six or seven—a fair index to the number of the eggs. Species of *Phasianus* and blood partridges are found in more or less close association with the Eared-pheasants. Foxes seem to be their most dangerous enemy, and doubtless many nests are raided by these animals. Several observers have spoken of the enjoyment which the birds seem to take in dust baths, this being apparently a daily habit during the warmer seasons of the year.

The flesh is eaten by the natives, but to a white palate it is rather coarse and not nearly as well flavoured as that of the common pheasant.

The four long, central, filamentous tail-feathers are very highly prized by the Chinese, and are of considerable commercial value, being used, as I have said, for an official decoration on the hats of Military Mandarins. Even in Kansu these feathers are valued at four cents each. For several years the skins were in demand in Europe by milliners, but this died out, fortunately for the birds. They are becoming seriously depleted in numbers in many places, however, and when once the country becomes opened up to the emigrant, meat-eating Chinaman of to-day, their days will be numbered.

The natives do not shoot the Eared-pheasant, the chief reason being that they cannot afford powder and shot, but they trap it with a most ingenious arrangement of a willow hurdle, propped up by a stick over a shallow pit in which is placed corn or other grain. A bit of an ear of corn is attached to a string, and when this is pecked or pulled, the stick is released and the hurdle falls, imprisoning the bird underneath in the shallow pit.

We are told by Prjewalsky that the "long and irregular intervals between their call-notes, and their extreme shyness, make it difficult to shoot them, at all events in the spring; besides which, the uneven ground in which they are found, covered, on the northern sides of the ravines, with dense bushes of rhododendron, and on the southern slopes with prickly bushes of barberry, hawthorn and wild rose, added to the numerous rocks and the fallen timber, make it most difficult sport. In such ground as this a dog is of no use, even were it able to follow its master up the steeper places. You have only your ears and eyes to assist you, and even these are not of much assistance, for the wary bird sees or hears you long before you can come up to it; it is a fast runner, and will never rise from the ground unless surprised. You may hear the patter of its feet a few paces off, as it disappears in some impenetrable thicket, before you have time to raise your gun, far less to shoot; and its tracks are as completely hidden as though it has dived under water. Its tenacity of life, too, is marvellous. I have seen them fly after receiving a whole charge of shot at fifty paces, and, if only winged, run into the bushes and escape. If by some extraordinary luck you happen to see one close by, you fire at once, as your only chance of a shot, and the charge blows the bird to pieces and spoils it for preserving. The difficulties, indeed, are so great, the odds against you so numerous, that nothing but the rarity of the bird induces you to try such thankless sport.

"My companion and I often went in pursuit of these pheasants, repairing to the woods long before daybreak, but only succeeded in obtaining two specimens; and two of the Tangutan sportsmen, whom I hired for that purpose, climbed the mountains day after day, but only succeeded in bringing home a couple by surprising them on their nests.

"The great difficulty lies in discovering the whereabouts of the bird, owing to the long, irregular intervals between its cries, whilst it is sometimes absolutely silent even on a fine bright morning. It is remarkable, too, how quietly, for so large a bird, it rises off the ground, when in extreme terror at your sudden appearance, and takes wing without your having heard it. It is slow in its flight like the capercailzie, and will not fly far."

The Blue Eared-pheasant has not, as far as I know, been brought alive to the Zoological Gardens of Europe. The eggs, as described from specimens collected in China, are five to seven in number, smooth, pale olive-grey in colour, unspotted. Two which I examined in a collection in India showed less of a bluish, more of a greenish tinge than the eggs of the brown eared-pheasant. Nehrkorn describes an egg as "Hellgrau wie die Eier von *Anas boschas*," and gives the measurements as 60 × 44 mm. These are considerably greater than the dimensions of two eggs laid by a bird kept by a Chinaman in captivity, which are only 44 × 30·5 and 43 × 30 mm. respectively.

. . . . . .

Thus, on the whole, we see that the habits of the Blue Eared-pheasant differ in no essential particular from those of the Brown species, and with the reservation of the difference in character of the country, they live their lives in much the same way in the little-known Kansu hinterland of China.

DETAILED DESCRIPTION

Adult Male.—Top of the head covered with short, black, recurved, velvety feathers; lores and sides of forehead, chin, throat and greatly elongated ear-coverts white. Entire upper and under plumage bluish-grey, most of the webs being disintegrated, loose and hairy. The first rows of true contour feathers on the occiput back of the velvety crown are white, forming a narrow transverse band of this colour, extending from ear-covert to ear-covert.

Secondaries dark brown, quite strongly glossed with purple. Primaries, paler dull brown, unglossed.

Tail typically with twenty-four feathers, the two central pairs bluish-grey with the webs wholly disintegrated up to the very shaft. The barbs are very long, curved and hair-like. Toward the extremity they become darker, and strongly glossed with metallic green, changing at the tip into purple, there being at this place a small spatulate area of firm webbing, strongly curved downward. The next few pairs of rectrices are more firmly webbed, the outer web strongly iridescent greenish and the inner violet-purple. The outer five or six pairs of tail-feathers show a variable amount of basal white, in typical specimens three-quarters of the basal area being of this colour, the distal portion of the feathers being metallic purple.

The variation in white in this Eared-pheasant I shall discuss in detail under the general heading of hybrids.

Bare facial skin, scarlet; irides, yellowish; mandibles, reddish horn; legs and toes, scarlet; spurs, paler; claws, dark horn. Length, 960; bill from nostril, 30; wing, 306; tail, 560; tarsus, 101; middle toe and claw, 80 mm. Spurs, short, stout, conical, 7 to 12 mm in length.

Adult Female.—Resembles the male, but with the spurs rudimentary, and is somewhat smaller in size. Bill from nostril, 28; wing, 290; tail, 490; tarsus, 94; middle toe and claw, 71 mm.

Immature Male.—This bird, which was collected in August, is about completing the moult from the juvenile into the adult plumage. Juvenile crown feathers short, dull brown but not recurved, except on the forehead. Upper neck similar to crown, but there is a faint whitish ring around the nape from ear to ear. New dorsal plumage fully adult, bluish grey with much decomposed webs. The few remaining juvenile feathers show none of this disintegration and are dull brown, indefinitely mottled with dull rufous buff. The remaining juvenile coverts show a pale white terminal shaft-streak and a broad terminal band of black.

Chin, throat and ear-coverts white as in adults. Ventral plumage shows a few remaining dull-brown, juvenile feathers, each with a large terminal spot of pale buff.

The wings are in a most active state of change. The delayed juvenile 9th and 10th primaries are still growing, not having reached their full length, the inner five are new; while the 6th, 7th and 8th are old full-grown juvenile feathers. These three are margined with pale buff on the outer web; the 9th and 10th are much like the new ones.

The outermost secondary is still unshed, showing on its outer web four or five irregular bands and patches of buff. Its covert is dull brown, still bearing strands of down upon its terminal barbs. The next four secondaries are nearly grown, plain blue-grey; but the remainder of the secondaries are old juvenile ones, brown, thickly mottled with buff. Both wings exactly correspond as to stage of moult.

The tail is wholly of new feathers, growing from without inward, the central ones a mass of short, wholly disintegrated barbs.

The bare facial area, while quite red, has the scattered featherlets more prominent than the papillae.

Bill from nostril, 24; wing, 228; tail, 200; tarsus, 74; middle toe claw, 56 mm. The spurs are very short, sharp tubercles.

EARLY HISTORY

The Blue Eared-pheasant was the first of its genus to be described, and, curiously enough, it has ever remained the least known of all the Crossoptilons. Over one hundred years ago, in 1811, Pallas described it as *Phasianus auritus* in his "Zoographia Rosso-Asiatica." The type has long since been lost, and the original description was so vague that when specimens of the brown species were discovered, the two were confused for many years. But when finally the Abbé David sent two skins of undoubtedly Blue Crossoptilons to the Paris Museum, all doubt was cleared away as to the relative distinctness of the two forms.

Phasianus auritus Pallas, Zoogr. Rosso-Asiat., II. 1811, p. 86; Gray, List Gallinae Brit. Mus., 1867, p. 31; Sclater, Ibis, 1874, p. 170.

Crossoptilon auritum Gray, Hand-list Birds, II. 1870, p. 259; Swinhoe, Proc. Zool. Soc., 1871, p. 399; Sclater, Proc. Zool. Soc., 1871, p. 495; Elliot, Mon. Phas., I. 1872, pl. 17; Prjewalsky, Mongolia, II. 1876, p. 121; id. in Rowl. Orn. Misc., II. 1877, p. 420; David and Oustalet, Ois. Chine, 1877, p. 406, pl. 108; Prjewalsky, Reisen in Tibet, 1884, p. 204; Stolzman, Proc. Zool. Soc., 1885, p. 431; Deditius, Jour. für Orn., 1886, p. 536; Prjewalsky, Ibis, 1887, pp. 403, 406; Pleske, Bull. Acad. St. Pétersb., XIII. 1892, p. 297; Grant, Cat. Game-birds Brit. Mus., XXII. 1893, p. 295; Grant, Hand-book Game-birds, I. 1895, p. 257; Nehrkorn, Kat. der Eiersammlung, 1899, p. 193; Schalow, Jour. für Orn., 1901, p. 412; Baker, Bull. Brit. Orn. Club, XXXIII. 1914, p. 121. Beebe, Zoologica, I. No. 15, 1914, p. 275.

Crossoptilum auritum Sharpe, Hand-list Birds, I. 1899, p. 35; Dresser, Man. Palae. Birds, II. 1903, p. 672; Parrot, Filchner Exped., X. 1908, p. 132.

Crossoptilon caerulescens David, MS.; Milne-Edwards, C. R., LXX. 1870, p. 538; id. Ann. Mag. N. H., (4), V. 1870, p. 308; David, N. Arch. Mus. Bull., VII. 1871, p. 11.

Crossoptilon harmani Elwes, Ibis, 1881, p. 399, pl. XIII; Baker, Bull. Brit. Orn. Club, XXXIII. 1914, p. 121; Elwes, Geog. Jour., XLIV. 1914, p. 364.

Crossoptilon harmani Dresser, Man. Palae. Birds, II. 1903, p. 673.

Crossoptilon auritum Wilson, A Naturalist in Western China, II. 1914, p. 123.

Harman's Pheasant Bailey, Geog. Jour., 1914, pp. 354, 355.

Crossoptilon auritum auritum Baker, Jun. Bomb. Nat. His. Soc. XXIV. 1916, p. 631.

Crossoptilon auritum harmani Baker, Jun. Bomb. Nat. His. Soc. XXIV. 1916, p. 633.

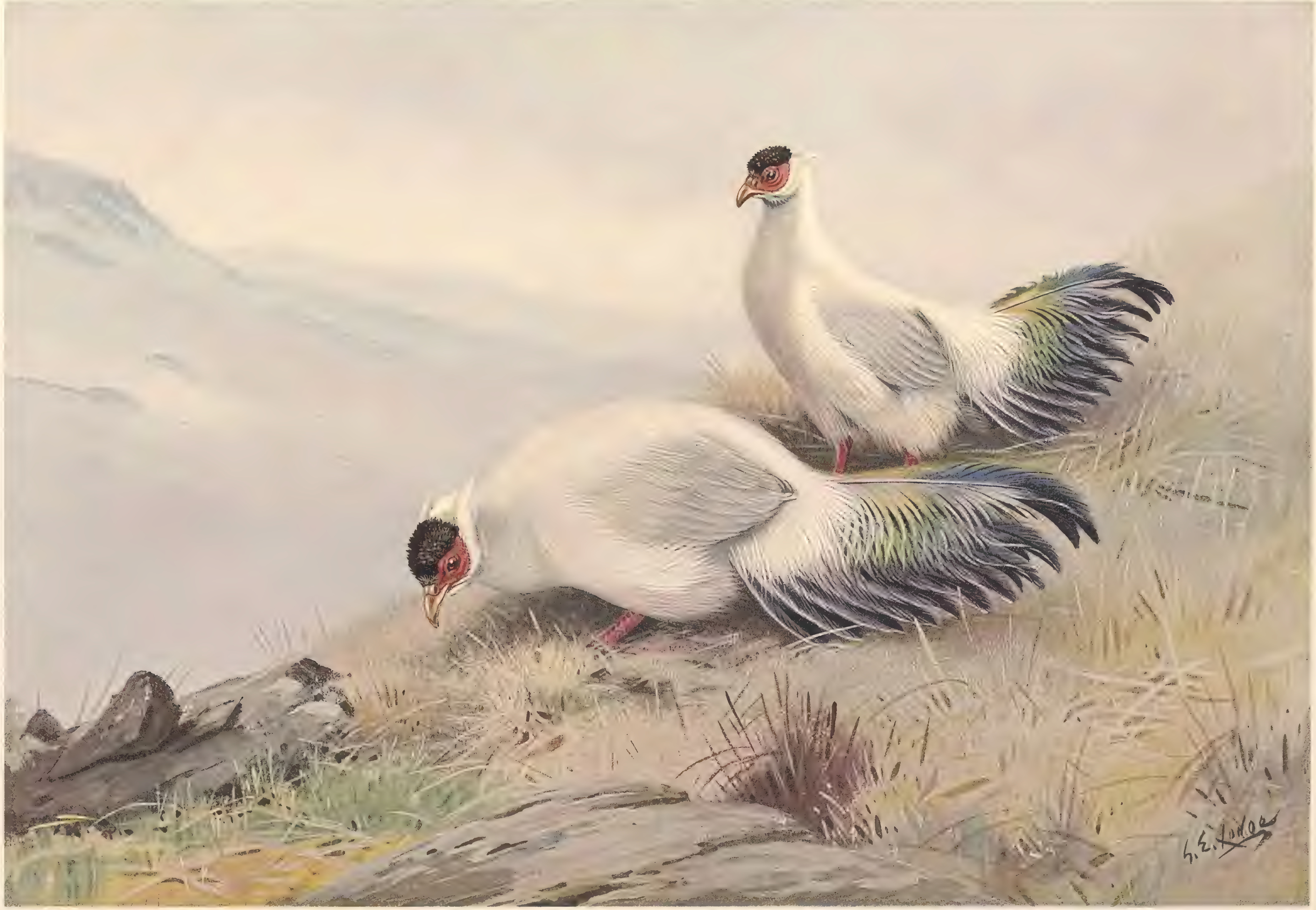
PLATE XX

WHITE EARED-PHEASANT

Crossoptilon tibetanum (Hodgson)

Although clad dominantly in white, these pheasants do not live in the snow, but retreat before the early storms of winter downward into the valleys. Their home is in south-eastern Tibet and central China, among the wildest mountains. Except in the breeding season they are gregarious, living in flocks and often associating intimately with the tiny musk deer. They keep to thick cover and are ever on the watch for the great eagles which swoop down upon them without warning. The Tibetans of this region are very superstitious and allow no animals and birds to be killed when they can prevent it. So the race of "Shaggas," as they are called, has a good chance for existence as long as the lamas wield this kindly influence.

PLATE XX



WHITE EARED-PHEASANT.

WHITE EARED-PHEASANT

Crossoptilon tibetanum (Hodgson)

Names.—Specific: *tibetanum*, from Tibet, the home of this pheasant. English: White, or Hodgson's, or Tibetan Eared-pheasant; Snow Pheasant. Vernacular: Bhote Dafé (Nepal); Shagga or Sharkár (Tibet).

Brief Description.—Male: Crown with short, curly, black feathers; elongated ear tufts, and entire body plumage above and below, pure white, becoming greyish on wing and tail-coverts; flight feathers usually brownish. Twenty feathers in tail, dark, glossed with greenish and with purple at the tip. Short, conical spurs. Female: Similar to the male, except slightly smaller in size and without spurs.

Type.—"Phasianus tibetanus," Hodgson, Thibet, Jour. Asiatic Soc., Bengal, VII. 1838, p. 864, pl. 46. Now in the British Museum.

Range.—The mountains of north-western Yunnan, western Szechuan and south-eastern Tibet.

THE BIRD IN ITS HAUNTS

One day, late in the year, in the heart of the wilderness of northern Yunnan, we crossed a rushing torrent at the bottom of a great mountain gorge. Not once, but several times we braved the boiling waters. The trail was exceedingly rough and steep, and covered with loose, round stones or with wet, slippery soil, but our horses carried us well. I had a Chinese guide and a native of some unknown tribe to carry the guns.

The lower part of the trail led through old, half-open, cleared fields, long abandoned by the Chinese, and bamboo and deciduous forests varied with dog-wood and an occasional cherry in unseasonable bloom. Half-wild grain fields appeared here and there even high up on the mountains, and it is remarkable how hardy these seemed, apparently little affected by the early frosts. They marked the old sites of huts, which with their owners had long since vanished from the earth.

Then we would dip down into a cool, damp ravine. At about seven thousand feet elevation we entered a beautiful forest similar in character to that of Jorepokri near Darjeeling, rhododendrons and oaks, covered—twig, branch and trunk—with long waving streamers and a thick coat of moss, yellow-green and of a hundred other tints.

Ferns flourished in profusion—real cold-weather ferns, although just before we entered this zone we had passed tree ferns at their maximum—great fifteen- and twenty-foot beauties.

Berries were in abundance—many poisonous, such as those wonderful, bluish-purple globes, glowing in the cool sunbeams which filtered through the moss. These brilliant fruits were strung beneath curving stems, which rose above the thick, cool moss—while everywhere below, over the ground, ran a maze of ruby berries, like those of our partridge vine.

Now and then tall chestnuts appeared, also clad in the dense moss. Begonias still held aloft their ghosts of seed-cups, and low, broad, prostrate leaves spread their variegated surfaces to catch what warmth they might.

Higher and higher we climbed, until the air held a tang even in the full sunlight. A clump of frosted, crumpled-leaved willows hugged the open reaches of the ravine streams; ferns—green near the ground—showed their brown frond tips curled again, but this time irregularly, in the burning agony of the first deadly frost.

The few jack-in-the-pulpit blooms which still stood bravely a thousand feet below, were here replaced by great cob-like ears of golden-orange kernels which lay prone against the bare earth of rain-washed banks, a blatant invitation to all passing pheasants. It was curious to see how many of these plants, growing inconspicuously amid the ferns and begonias on the sides of the ravines, when their fruit had ripened and hung limp on the wasted stems, invariably drooped down over the edge of the earthen bank, against which they shone as a brilliant splash of colour.

The familiar shape of grape leaves caught our eye, and we found the vines in abundance creeping over the ground.

Then came the change to ten-foot bamboos, growing as closely together as the stems would stand. A dip into a steep narrow ravine would again bring into view mossy trees and ferns. Willows bordered the damp places, and on the higher bits of level ground low plants, with beautiful wine-red leaves, abounded, and masses of tall everlasting—true to their name if picked at once, otherwise dissolving into filmy seed-heads. Banks of small-leaved strawberries covered the ground in some places.

The last few zigzags of the trail ushered in the forests of rhododendrons, replacing the oaks and chestnuts and receiving their legacy of moss drapery. The slopes above and around us now showed the rounded, close-foliaged tops of these trees, each rosette of leaves encircling the furry, close-wrapped buds of next year.

Then we reached the summit of the pass and found a half mile of level winding trail, leading between rounded low hills, all covered with scrub bamboo and willow. The bamboo was stiff, large of stem and small of leaf, and rising not more than two feet above the ground. Here, even in the sunshine of midday, the rushing winds brought a bitter blast of cold. Dwarf plants, each with a pea-like blossom of brightest blue, snuggled close to the ground, and here and there rounded boulders bunched themselves amid the low bamboo stalks. The rocks were of rose or whitest quartz, painted with spreading plots of emerald-blue lichen, and a wonderful pattern etched by the stinging blasts of winter. In the centre of the pass meandered a bog, unfathomable, which in some strange fashion drew moisture from lofty peaks many miles away, and in turn fed the rushing waters which foamed through every ravine. The ranks of reeds which filled the bog were linked one to another by a glistening sheen of ice—a nightly forecast of the bitter winter storms, soon to fill all this gorge with snow.

Scattered among the bamboo fields were the dead lily stems so familiar to us in the Himalayan sky fields, although these were empty—both of seeds and earwig tenants.

Clinging to the low stems or flitting from one stunted willow bush to another were cheery little tits—those marvels in feathers, which laugh at height or temperature. These were exquisite little atoms—finger lengths of fluff with chestnut caps and waistcoats.

High overhead soared, and at times screamed, a great eagle, black as night, with widespread stretch of straight-edged wings, completing the picture with his calm grandeur—the virile aerial creature which mocked our panting efforts to look down upon the world.

When we passed the last of the frozen bog, the view expanded into a magnificent panorama of tumbled mountains. Behind was the far-stretching gorge, an opening vista of distant lowlands and warm plains, but before—the wilderness of northern China held its mean level but little beneath our own, while its peaks towered thousands of feet above us.

Everywhere the rounded heads of the rhododendrons dominated all other growths, with lofty dead and gnarled veterans whose knotty, stubby branches showed at what terrible cost had been gained their supremacy of years long past.

This bleak zone housed other brave creatures, which had begun their wandering downward, driven from the unsheltered ridges and eastern slopes by the heavy snows which covered the peaks above us. Once, and once only was a glimpse permitted to us of the wonderful White Eared-pheasants. As we rested for tiffin, three birds came into an open space where a slip of rock had swept down a swath of trees some distance below. The instant they appeared they saw us, and simultaneously discovered the eagle, which by this time had become a mere speck in the blue. We were disregarded—each head was turned sideways—every circle of the bird of prey was followed with those avian eyes which all but shame our telescopes. The white ghosts of birds showed clearly against the dark green rhododendrons. They showed no fear, not even a movement which indicated uneasiness. Only every fibre was alert, concentrated on the threatened danger. Two steps would carry them into the very heart of the impenetrable thicket, where they would be safe from pursuit; hence, I suppose, their nonchalance and disdain of instant flight.

I was impressed with the difference of action of this White Crossoptilon as compared with that of the brown eared-pheasant in the presence of a bird of prey. The latter crouched at once, merging their sombre forms with the surrounding rocks and grass. These birds stood erect, ready for instant movement, but without a hint of attempt at concealment. Did they know by the instinct of long lives of experience of the futility of attempting to conceal their immaculate figures in any but the densest, darkest tangle of the rhododendron underworld? It would seem so.

A mist sifted low across the valley below us, thickened into cloud and drove swiftly on an eddy of wind up to our very feet, reflecting the sun as through a sea of foam. Swiftly as it had formed it dissolved again, and the valleys, the opposite slopes, the dark rhododendrons, the pale green ranks of bamboo all came out crisp and clear, but the White Pheasants—where had they gone? Into the dark, mysterious ravine, whence they were as safe from pursuit as if on another planet.

The vision was one which I shall never forget, a glimpse so evanescent, so ethereal, that I could hardly believe that the whole had not been a figment of the imagination.

The eagle, too, had vanished, and now there came from the cold peaks long streams of cloud mist, which sifted down each valley, coalesced, thickened, and soon we were enveloped in a dense fog which shut out everything from view. Not a glimpse of tree or mountain or sky was permitted; of the sinking of the sun we knew only by the gradual darkening of the impenetrable cloud, and when at last we crawled, shivering, into our sleeping-bags, every bit of cloth, every article in the tent, was saturated with the condensing moisture. Somewhere far off, perched among the rough, knobby branches, were three birds of purest white, their soft plumage matted with the moisture, their heads drawn back in soundest sleep.

GENERAL DISTRIBUTION

The White Eared-pheasant occurs in the mountains of western Szechuan and eastern Tibet. Until I observed three specimens in the extreme north-western finger of Yunnan, not far from the Burmese boundary, it had not been observed south of the Yangtze in China. Davies records the species in latitude 28°, just north-east of Chungtien, and my observation extends this southward to about 26°. In western Szechuan it inhabits the high mountains from twelve to over fourteen thousand feet, in forests of spruce, birch and prickly oak. For more details we must await future exploration. To the west and north-west individuals seem to exhibit a greater variation, and through hybridization or other factors to show characters hinting of the blue *auritum*.

GENERAL ACCOUNT

During the course of a journey from west to east across Tibet, Captain Hamilton Bower several times met with the White Eared-pheasant, or Shagga, as the natives call it. This was when he had commenced to leave the Chang, or great plateau of central Tibet, across which he and his party had travelled for months without descending below fifteen thousand feet. Beyond the Nam La Pass, at the lower elevation of thirteen thousand feet, the Eared-pheasants were first seen. On the 23rd of December Captain Bower writes: "As we heard stags were to be got on the road, Dr. Thorold and myself started off in front of the caravan in the hopes of seeing some. As we descended the valley, the country became very gamey-looking; the lower parts of the hills were covered with *Juniperus excelsa* and above were bushes in snow; that is the sort of place to find stags. We were, however, unfortunate in not seeing any, though musk-deer were exceedingly plentiful, and also white pheasants, called "shagga" in Tibet. They are large, handsome birds, but terribly hard to kill; the only chance of getting them is a pellet through the head. I carefully stalked a flock of them, and, getting close, knocked feathers out of some most freely, but they went away apparently none the worse; following them up again I managed to bag one, but several more went away hit; it was very annoying wasting cartridges, and especially as in no case had I taken any but the easiest of pot shots. They were all feeding amongst juniper bushes, and the crop of the one I got was full of the berries. Their cry is a whirring sound, varied occasionally by a short cluck, and they are generally found in flocks of about thirty. Lower down we often found them in the fields close to the houses. As I descended from the hills with the bird in my hand, I was met by a number of men with guns who had come out to stop the shooting; they said that if any animals were shot, everybody living in the valley would become ill. They are a terribly superstitious people, and in their superstition are apt to become dangerous."

Twenty-one days later, at a place called Mongothong, some three hundred miles travel to the eastward, Shaggas were again encountered; up a pass over fifteen thousand feet high, where numbers of these White Pheasants were to be seen running about in every direction in this uninhabited country. Two were shot. Gazelles and stags were abundant. Again on the 4th of February, at Lanipa, we read: "After getting in, as three hours of daylight remained, we went to look for pheasants in jungle composed principally of a sort of holly oak with a few fine trees scattered about. We found three sorts: Shagga (*Crossoptilon tibetanum*), Tsiri (*Ithaginis geoffroyi*), and Koonon (*Tetraophasis szechenyii*), all three sitting on trees." Two days later, near Noru Tonga, Bower made "a rather long march up a valley all the way, passing a high watch-tower where, according to orders, two men are always posted to keep a look-out for enemies. . . . On the road we saw some Shagga at nine thousand feet, the lowest point at which we had seen them."

Elsewhere, the author adds, the Shaggas "go about in flocks of about thirty, and their colour and size make them extremely conspicuous on a hillside. Of all game-birds I have ever met, they are the hardest to kill. The way we knocked feathers out of them without bringing them to book was very trying, more especially as our stock of cartridges was not large. They were most plentiful in the neighbourhood of Rinchi."

Abbé David, many years before, in his *Oiseaux de la Chine*, writes as follows concerning the White Eared-pheasant in China proper: "The White Crossoptilon is found in China only in several wooded localities on the mountains of the country of the Mantzes, for example at Yaotchy and at Tatsienlu, where its existence is protected by the superstitions of the natives. It is a bird gentle and sociable, which likes to live in company with its kind, especially at the time of the rearing of the young, and it is not easily separated from those which it had produced. Its food consists of leaves, roots, grains, and insects. Fortunately for the conservation of the species, the flesh of this fowl has a very inferior flavour; therefore the hunters prefer as game those pheasants which are not only more widely spread but more easy to catch.

"The females, and the young males, before their first moult, may be distinguished by their less pure colours and smaller ear-plumes."

During a journey made in 1899 through western Szechuan, Captain H. R. Davies made the following notes in regard to the White Eared-pheasants: These "large white birds with dark-coloured tails were common in the same sort of localities as the blood pheasants." This would mean at elevations never below eleven thousand feet, keeping just below the snow line, which, of course, varies at different seasons of the year. They are confined to the forest, and seem never to be met with on the bare tops of the ranges. The White Eared-pheasants "are found in large coveys, and run very fast, scarcely ever flying, while they are so wary that, although I saw a great many, I could never get near enough for a shot. Their call is a very loud, harsh crow, which can be heard for a mile or two. They keep to high altitudes, and are often found in the snow."

The late Mr. Tappey writes to me that the White Eared-pheasant is found in flocks, and while feeding there is usually one cock on the lookout, often perched on some tallish spruce or on a rock. When startled, their call is similar to the gobbling of a turkey. At such a time all move rapidly uphill or take to flight.

They feed on lily bulbs and flowers, stems and bulbs of the wild onion, which gives to their flesh a strong odour and taste of onion. Eared-pheasants roost in large spruce trees, usually several birds together. They moult in August. Occasionally their skins may be seen hanging in Tibetan houses, and the natives often wear the foot of one of these birds as an amulet or charm.

Writing of the neighbourhood of Tatsienlu Mr. Wilson gives the following notes on the White Eared-pheasant. It is abundant in this vicinity and "frequents the upper timber-belt between 9,500 and 13,000 feet, being commonly met with in large flocks, more especially in autumn, when it is probable that several convoys join forces. West of Tachienlu on the highway to Batang it is frequently to be seen strolling about in open grassy places and across the roadway. The walk is suggestive of a fine farmyard rooster, and with its broad, slightly raised, arching plume-like tail the bird looks very stately. It is a great runner and always makes straight up the mountainside into thick cover. When flushed it takes wing with the speed of a bullet, and with its heavy body makes a great noise on rising. The flight is of short duration and only attempted as a last resource; generally the bird alights on trees.

"Hunting this strong-legged, handsome bird is most 'winding' and fatiguing sport. A favourite food is wild onions, and the strong flavour of this esculent permeates the flesh, which is dark-coloured and coarse and of little value for the table. The average weight of an adult male is about 8 to 9 lbs.

"This Crossoptilun ranges throughout the sub-alpine regions, bordering the timber-line from south-west of Tachienlu to the neighbourhood of Sungpan Ting, and is one of the commonest birds found in this region. The vernacular Chinese name for this bird is 'Mache'; a Thibetan name is 'Shar-har.' How far to the south and west of the regions indicated this bird ranges I have no knowledge." Brooding commences about the beginning of June and possibly earlier. By the end of July the chicks are of good size and strong on the wing.

Nothing further seems to have been observed of this magnificent pheasant in the wild state. The nests that have been found have resulted in no recorded information beyond that the number of eggs is from four to seven. Eggs of the White Eared-pheasant collected near Tatsienlu, Szechuan, are regular broad ovals, very glossy, and smooth. They are of a pale stone, pale buff or reddish-buff colour. Some are plain, others are sprinkled, chiefly at the larger end, with specks of reddish brown. They measure from 58 to 62 mm. in length, and from 43 to 44 in breadth.

CAPTIVITY

With the exception of the brown eared-pheasant, the White one is the only one which has been taken out of Asia alive. A very small number of individuals have been kept in several of the Zoological Gardens of Europe, and in Berlin the birds have laid eggs but not bred. Three specimens were captured in the mountains of Szechuan, near the snow-line, at an elevation of nearly fifteen thousand feet, near Tatsienlu, by E. A. Pratt, and were received at the London Zoological Gardens in 1891. At the same institution there is a longevity record of seven birds of this species, one of which lived two years and eight months. The average length of life was only twenty-two months. No other facts have been recorded—another of the countless opportunities missed which must be chalked up against those who have had the chance to make notes upon such characters as gait, voice, sociability, method of securing food, courtship and fighting,

HOME AND FEEDING GROUND OF THE WHITE EARED-PHEASANT

Climbing upward from a cool, dark ravine in northern Yunnan, I passed through zones of moss-hung oaks and rhododendrons to frosted, stunted willows and dwarf bamboos. Looking back down the forest-covered slopes, I saw three White Eared-Pheasants step out into a glade. They watched me, and they watched a great black eagle which hung high overhead, and they stood poised so that they could dash to safety into the undergrowth. Finally a mist drifted across the valley—a wisp of cloud as white as the birds themselves. Swiftly as it had formed, it dissolved again, and when it had passed, the pheasants had vanished.

Descending to the spot, I found their tracks at the foot of a gnarled-rooted trunk amid a tangle of dying jack-in-the-pulpit and forest débris. That night, when I crawled into my sleeping-bag, I knew that somewhere far off, perched among the rough, knobby branches, were these birds of purest white, their soft plumage matted with moisture, their heads drawn back in soundest sleep.

HOME AND FEEDING GROUND OF THE WHITE-EARED PHEASANT.

method of roosting and numberless other facts of the life history of birds which are of as great value when observed in captive specimens as when based upon wild ones.

DETAILED DESCRIPTION

Adult Male.—Top of the head covered with short, curly, soft, velvety, black feathers. Ear-coverts silvery white and greatly elongated, forming a long, white, upcurving tuft on each side of the head. The entire plumage, above and below, pure white, shading into grey on the longer wing and upper tail-coverts, the webbing of the feathers being extremely loose and hairy; secondaries blackish brown, and somewhat glossed with purple; primaries dark brown. Tail composed of twenty feathers, purplish-bronze towards the base, shading into dark greenish blue and deep purple towards the extremity of the feathers. While the marginal portions of the barbs of these central feathers are long, curved and very loose, there is no such disintegration as in the central rectrices of *mantchuricum* and *auritum*, which seem to be of the nature of abrupt mutations in length, of upper tail-coverts.

Bare parts on the side of the head; legs and feet, scarlet; bill, reddish horn; iris, orange yellow. Length, 920; bill from nostril, 38; wing, 330; tail, 575; tarsus, 100; middle toe and claw, 81 mm. The spurs are stout, short and conical.

Among pure-blooded adult White Eared-pheasants there is great variation in the exact shade or degree of whiteness. These birds unquestionably require several years to eliminate entirely the brown pigment which predominates in the plumage of the immature birds. Of the body plumage, the mantle seems to hold the grey tinge longer than the remaining parts, but the primaries are the best index. In extreme examples of whiteness (birds from farthest west, away from the haunts of *auritum*), the outer webs of the primaries are pure white and the inner webs are pale grey. These individuals have the plumage as a whole pinkish white, while in less extreme birds it has more of a creamy tinge. In these pinkish, western Tibetan birds the tail-feathers are all grey at the base, shading into iridescent purple on the outer feathers. As we proceed inward, a bronze-green tinge appears, and on the central rectrices this colour occupies all the median portion of the vanes between the grey base and the purple terminal third.

Adult Female.—Similar in plumage to the male, but slightly smaller in size. Bill from nostril, 27; wing, 298; tail, 400; tarsus, 97; middle toe and claw, 76 mm.

Immature Male.—This individual was in its first-year plumage, beginning the second autumn moult. The velvety crown plumage is shorter than in the fully adult bird. The body plumage in general is of newly moulted white feathers, but mingled with these are a number of unshed first-year feathers. These are decidedly brownish-grey and of much more solid texture, less decomposed, than the succeeding white plumage. These earlier feathers are confined chiefly to the mantle and median wing-coverts.

The secondaries are of the old, first-year plumage, and are wholly dark brown with some slight sheen on the outer webs. The wing measures 290 mm. in length, as compared with 330 in the adult. The tail is in full moult. The old feathers are less iridescent, more of a brownish-black in tone, and hold this colour to the base. The centre ones are only 415 mm. in length, as compared with 515 in the adult. The moult is proceeding regularly from outside inward, the inner five pairs of rectrices being as yet unmoulted.

Thus the younger plumage is in general much darker, and less decomposed and iridescent, and the wing and tail are shorter. There is, however—and this is a very important point—no difference between young and adult in amount of distinct dark and white areas, and herein lies the vital difference due to infusion of blood of such a coloured bird as *auritum*. Such colouring is very different from the gradual clearing up and whitening of the plumage as a whole, which results from successive moults. I shall again have occasion to refer to this matter.

EARLY HISTORY

Hodgson, in 1838, described a white pheasant under the name of *Phasianus tibetanus*. He obtained this bird in Nepal from a native envoy who had just returned from Pekin, and as for many years this specimen remained unique, its haunts were for an equal length of time wholly shrouded in mystery. Ultimately it was found that typical *tibetanum* had no white patches on the tail-feathers, and thus Hodgson's bird was not absolutely pure-blooded, but had some taint of *auritum*.

SYNONYMY

Phasianus (*Crossoptilon*) *tibetanus* Hodgson, J. As. Soc. Beng., VII. 1838, p. 864, pl. 46; id. Ind. Rev., III. 1839, p. 593.

Crossoptilon tibetanum Hodgson, in Gray's Zool. Misc., 1844, p. 85; Sclater, List of Phas., 1863, p. 6, pl. 4; Gray, List Gallinae Brit. Mus., 1867, p. 31; David, N. Arch. Mus. Bull., VII. 1871, p. 11 [Moupin]; Elliot, Mon. Phas., I. 1872, pl. 14; David and Oustalet, Ois. Chine, 1877, p. 407, pl. 107 [W. Sze-chuen]; Hume, Stray Feathers, VII. 1878, p. 426; Scully, Stray Feathers, VIII. 1879, p. 343; Seebohm, Ibis, 1891, p. 378; Sclater, Proc. Zool. Soc., 1891, p. 464; Seebohm, Bull. Brit. Orn. Club, I. 1892, p. XVIII; Oustalet, Ann. Sci. Nat., (7), XII. 1892, p. 315 [part]; Ogilvie-Grant, Cat. Game-birds Brit. Mus., XXII. 1893, p. 293; Bower, Journey across Tibet, 1894, p. 294; Ogilvie-Grant, Hand-book Game-birds, I. 1895, p. 252; Sclater, List Animals London Zool. Gardens, 1896, p. 486; Davies, Ibis, 1901, p. 409; Tegetmeier, Pheasants, 1904, p. 228; Mitchell, Proc. Zool. Soc., 1911, p. 521; Beebe, Zoologica, I. No. 15, p. 275.

Crossoptilon auritum Gray, Genera Birds, III. 1845, p. 495, pl. CXXV; id. Cat. Hodgs., ed. I. 1846, p. 124.

Crossoptilon drouynii Verreaux, N. Arch. Mus. Bull., IV. 1868, p. 85, pl. III [Moupin]; Swinhoe, Proc. Zool. Soc., 1871, p. 399; Elliot, Mon. Phas., I. 1872, p. XVIII, pl. 15.

Crossoptilon tibetanus Gray, Hand-list Birds, II. 1870, p. 259.

Crossoptilum tibetanum Hume and Marshall, Game-birds India, I. 1878, p. 115, pl.; Seebohm, Ibis, 1891, p. 378 [W. Sze-chuen]; Blanford, Fauna Brit. India, Birds, IV. 1898, p. 88; Sharpe, Hand-list Birds, I. 1899, p. 35; Oates, Cat. Eggs Brit. Mus., I. 1901, p. 53, pl. V, fig. 4; Dresser, Man. Palae. Birds, 1903, p. 671.

Crossoptilon leucurum Seebohm, Bull. Brit. Orn. Club, I. 1892, p. xvii; id. Ibis, 1893, p. 250; Bower, Journey across Tibet, 1894, p. 296.

Crossoptilum leucurum Dresser, Man. Palae. Birds, II. 1903, p. 671.

Crossoptilun tibetanum Wilson, A Naturalist in Western China, II. 1914, p. 122.

Crossoptilon tibetanum tibetanum Baker, Jour. Bomb. Nat. His. Soc., XXIV. 1916, p. 626.

Crossoptilon tibetanum drouynii „ „ „ „ „ p. 629.

WILD HYBRIDS

Genus *CROSSOPTILON*

Of the five usually recognized species of this genus I can accept but three, and indeed I am not wholly satisfied that two of these are of more than sub-specific rank, making but two full species.

Crossoptilon mantchuricum Swinhoe.
Crossoptilon auritum (Pallas).
Crossoptilon tibetanum (Hodgson).

A review of the specimens of the two latter species in many museums shows that many birds from the eastern part of the range show characters intermediate between the blue *auritum* and the white *tibetanum*. This may be observed in a variable amount of white, a differing number of tail-feathers and even asymmetrical patterns, developed to a greater extent on one side than the other. This hints strongly of hybridization. In these intermediate localities have been found not only typical specimens of each, but also a number of these parti-coloured birds, to some of which has been given specific rank. These are, in my opinion, examples of that very unusual phenomenon in nature—hybridism, between the two very distinctly coloured forms. No other explanation seems open.

Crossoptilon harmani

I wish to present evidence which seems to indicate that this so-called species is only one of many variations, due to the crossing of *auritum* and *tibetanum*. The particular individuals which approached the original description of *harmani* resemble much more closely *auritum* than they do the white species of Eared-pheasant.

In order to sum up completely the evidence, I shall give in full the original description, which, with a coloured plate was published in the "Ibis" for 1881 by Henry J. Elwes.

"*Crossoptilon harmani*, sp. nov. (Plate XIII).

"Bill horn-colour tinged with red, 1½ inch long from gape, and ⅝ inch deep at nostril. Lores and a space surrounding the eye, 2 inches long by 1 inch deep, naked, red. Top of head covered with short velvety blue-black feathers. A band on occiput, chin, and middle of throat, for a space of about 5 inches from the beak, white. Ear-coverts produced, nearly 2 inches long, white. Rest of neck, back, wing-coverts, breast, flanks, and under tail-coverts dark slaty bluish. Upper tail-coverts long, rather greyer than back. Centre of belly white. Primaries and secondaries dark slaty bluish, with purplish reflections. Wing 12 inches long. Tail composed of twenty graduated feathers, the central pair about 18 inches long, the lateral pair about 9 inches, bluish purple, with violet and green reflections on the central four or five pairs. Tarsi strong, 4 inches long, with stout spurs. Middle toe, with claw, 3 inches long. Legs and feet vermilion-red.

"*Hab.*—Eastern Tibet, about 150 miles east of Lhasa (*Harman*).

"This species resembles the figure of *C. auritum* Pall., given in Elliot's 'Phasinidae' in its general coloration and markings. It may, however, be easily distinguished by the tail—which has no white in the centre of the lateral feathers, and is quite differently coloured. The type of *C. auritum*, according to Elliot, is lost; it is, however, described by Pallas as having eighteen tail-feathers. Mr. Elliot's plate is taken from specimens collected by the Abbé Armand David in the provinces of Shensi and Kokonor, and originally described as *C. caerulescens* David ('Comptes Rendus,' lxx. p. 538, 1870). The figure shows twenty tail-feathers, as is the case with my bird; but whether the species collected by David is really *C. auritum* Pall. or not, my bird is clearly distinct from both of them, so far as can be ascertained without seeing the specimens themselves.

"For this fine species I am indebted to Lieut. Harman, R.E., who has distinguished himself as a surveyor and explorer of the Eastern Himalayas, especially in Sikkim, where he has been employed for some years. When at Darjeeling in December last, I saw the skin of what I at once recognized as a new *Crossoptilon* hanging on the wall of his room. Unfortunately it had never been properly preserved, and was in such a terribly moth-eaten state that the remains, which he kindly presented to me, and which are now in the British Museum, are hardly worth preserving. They have, however, proved sufficient for Mr. Keulemans to make a very accurate drawing, the only fault of which is that the ear-coverts do not seem in the specimen to be so strongly developed as in the figure.

"The skin was brought to Mr. Harman by one of his native surveyors, who said that he had procured it 150 miles east of Lhasa, at an elevation of about 6000 feet, where it was found in flocks during winter. This part of Tibet has never been visited by any European or by any of the late Mr. Mandelli's native hunters, and having, as reported, a much milder climate and more luxuriant vegetation than the western parts of Tibet, may be expected to produce a number of remarkable and, as yet, unknown species.

"This makes the fifth, or, if *C. tibetanum* Hodgs. and *C. drouyni* Verr. should prove to be identical, the fourth species of the genus known; and though it is probable that, as in the genus *Phasianus*, the local races or species of *Crossoptilon* will be eventually found to merge insensibly into each other, yet there is no difficulty in distinguishing them so far as we know at present."

The principal points of difference between this so-called *harmani* and typical *auritum*, is the greater amount of white on the body plumage—extending well down on the fore neck, forming a very broad (12 mm.) occipital collar, and a well-marked but small white patch on the belly, and combined with this the total absence of white from the tail.

In the literature of the species of *Crossoptilon* we find references such as the following by Parrot, in his report on the Filchner Expedition to China and Tibet. The translation reads—

"A specimen of *Crossoptilon auritum* collected at Lussar, which the knobby spurs show to be a female, is interesting from the fact that it appears to possess affinities with the related *Crossoptilon harmani* from Eastern Tibet. Twenty-one tail-feathers are present, including the central feathers. . . . The lateral rectrices are milky white for more than three-quarters of their length. A narrow band of brownish-white upon the sides of the occiput and crown could hardly be more distinct. The dirty white of the mid-jugular region reaches down to the upper breast. Otherwise the description of *auritum* agrees with this bird." And another specimen which he describes, from the Tsin-ling Mountains, varies in still other particulars from *auritum*.

As we have seen, the species *harmani* was based upon a single individual. At least a half-dozen are now to be found in various museums. To take but one from among a number, let us consider a specimen of *Crossoptilon* in the Musée d'Histoire Naturelle of the Jardin des Plantes. The label reads, "Crossoptilon auritum, var. April, 1890. Tioungen, Tibet. Prince H. d'Orleans. No. 626D." It is *harmani* as far as the white extension down the fore neck and the great breadth of the occipital band is concerned, but the ventral patch of white covers the entire belly from the breast backward. The tail-feathers are all present and number *twenty*, and on six or seven pairs there is a great deal of irregular, asymmetrical white.

If we recognize Elwes's individual as *harmani*, we must give this white-tailed, white-bellied specimen another name. Four others which I have examined in various museums deserve individual recognition on such characterization. The asymmetrical character of the markings, together with their constant variation in individuals, emphasizes the error of any such course, whether we would prefer to consider them species, sub-species or local races.

Recently several additional specimens showing corresponding variations have been gathered by Captain Bailey in the Mishmi-Abor Hills in the valley of the Tsangpo River, at an elevation of from ten to twelve thousand feet, where the birds were said to have been breeding. An adult cock has the upper parts dark ashy-grey, almost black on the neck instead of blue-grey, while the rump is very pale. There is a white nuchal band, and the white of the chin extends in a narrow line down the throat and fore-neck. The sides of the neck and upper breast are very deep glossy ashy-grey, gradually changing to paler ashy-grey on the flanks and breast, and to white on the middle of the abdomen. There is no white on the tail-feathers.

A chick from the same locality is supposedly of the same uncertain strain, as it exhibits characters both of typical auritum and of so-called *harmani*. The white nuchal band of *harmani* is present, but the white does not extend down the throat, being in this respect like *auritum*. This bird is thought to be about two weeks of age. The upper plumage is dull black, changing to dark ashy-grey on the rump and upper tail-coverts. The shoulders and the wings are vermiculated with reddish bars, and the wing-coverts have broad, reddish fulvous shaft-streaks. The ear-tufts are partially developed.

The upper breast and flanks have the feathers black with the centres and terminal fulvous. The lower breast and abdomen are dirty white, the vent and under tail-coverts dull ashy-grey with white tips, and the tail-feathers are blue-black, slightly glossed with blue. Iris, brown; bill, horn-coloured, lighter below; legs reddish-brown. This chick was killed on July 16th.

It is doubtless the interbreeding of generation after generation of the two distinct colour forms which has produced such otherwise inexplicable variation and asymmetry of colour and pattern. I therefore sink the name *harmani* in the synonym of *auritum* as a probable wild hybrid between that species and *tibetanum*. In view of the observations which follow there is no reason to credit the mutilated type specimen of *harmani* with having originally had more than twenty-two, or even twenty, rectrices.

Crossoptilon leucurum

This name is based on individuals collected within the range of *tibetanum* in eastern Tibet, which resemble *tibetanum* in body plumage and *auritum* in the presence of white in the tail. Other distinctions, as I shall show, are based on erroneous examination of the characters.

I have carefully studied the male and female types in the British Museum. Mr. Grant, in his "Handbook of Game-birds," states by direct inference that this species has twenty tail-feathers, but this is an error. The female type has twenty-one rectrices remaining, having lost the outer left, making twenty-two in all. The male type has twenty rectrices left in the skin, but a glance at the roots of the tail feathers beneath the lower coverts shows the deep holes and the gap in the ranks marking the loss of another pair.

The female type is strongly suffused with blue-grey except on the belly. The white spotting of the tail is carried to an extreme. On the outer feathers it is confined to one web, although, as usual in these hybrids, varying greatly on the two sides of the tail; the third pair having the right feather with both webs whitened, and the left feather with only the outer web so marked, etc. This white increases as we approach the central feathers, until on the next to the inner pair the purple gloss is restricted to a very narrow margin and the terminal fifth of the feather. In the central (supernumerary) pair the white is again restricted to an elongated patch on the outer web, the inner web being grey. Even this pair is asymmetrically patterned, the grey invading the white outer web along the shaft in the left feather, while the right has a small patch of white near the anterior portion of the grey. The very dark secondaries also show white patches on the outer web, a character occasionally found in more typically coloured *tibetanum* individuals.

The male type has the greatest amount of white of any specimen I have examined, the purple on all the rectrices which remain being confined to the extremity.

A second male in the British Museum possesses only twenty rectrices, and the closest examination shows no signs of any having been lost. In this bird another colour combination is found; the greatest amount of white being present on the *outer* rectrices, and gradually diminishing inwardly until the central feathers are much like those of a typical *tibetanum* individual.

In the Rothschild Museum at Tring an adult male "*leucurum*" is intensely white over all the body, except for the brown shafts of the flight-feathers, and the more or less mottling of dark on the basal half of their inner webs. The outer three pairs of rectrices show a great deal of white on their outer web, the inner being grey. The next two pairs are pearl-grey, and on the succeeding inner feathers the light colour is more or less confined to the web near the shaft. There is no distinct margin to the light colour, making the usual rounded spot, but it merges by a gradual black cloudiness into the distal metallic gloss. In fact, the tail colouring in this individual closely resembles *mantchuricum*.

The extreme variability of the rectrice white would seem to indicate the worthlessness of this character as a means of specific differentiation.

Crossoptilon drouynii

The type of this so-called species is in the Musée d'Histoire Naturelle, in Paris. The entire body plumage is white. The secondaries are slightly shaded with grey, and the primaries clouded on the inner webs with grey. The shafts of all the flight feathers are dark brown. The tail-feathers are twenty in number, greyish-white at the base, shading on the terminal half into metallic bronze-green and deep purple.

. . . .

In *tibetanum* with a slight admixture of *auritum* blood we thus find a pronounced tendency to variation in the white of the tail-feathers. The first hints of this occur in the form of small elongated spots on the outer webs of the lateral rectrices. About twenty per cent. of the males show this phase, and in the type of *tibetanum* these spots are well developed, though asymmetrically, on the six outer pairs. *Crossoptilon drouynii* was based on an individual with greyish-white rectrices.

C. leucurum shows extreme variation, no two individuals in the museums of England, France and elsewhere being alike, and many showing very great differences. This is true, as we have seen, not only as regards colour and pattern, but even in the number of rectrices, there being twenty in some individuals, and twenty-two in others.

The only logical solution of this tangle is to consider *harmani*, *leucurum* and *drouynii* as hybrids and sink them in the synonomy, the first of *auritum* and the two latter of *tibetanum*, according to whether the blue or white colouring predominates.

The variation in number of tail-feathers in *Crossoptilon* is of interest. In *tibetanum* there are twenty, and all with vanes quite solid and normal in structure. The whiter *leucurum*-like birds show no change, but in most of those individuals which approach *harmani* and *auritum*, an extra central pair of highly disintegrated feathers appears, *above* the others, suggesting, from their position, derivation from the upper tail-coverts. In *auritum* still another pair is present, making twenty-four in all, this additional pair also being central, superior, and much disintegrated. So the specialization is definite as to position. In more than one bird, which in colour from beak to tail is typical *auritum*, I have found after careful macro- and microscopical examination only twenty-two rectrices; none having been lost accidentally, but one of the central pairs being congenitally absent. These birds were unquestionably hybrids with the lessened number of rectrices as the sole indication of their mixed blood.

In the rather isolated, more generalized, brown *mantchuricum*, twenty-two is the normal number, and here we find but a single pair of central, superior disintegrated tail feathers, showing that the locus of specialization is the same as in the other species.

In the presence or absence of certain rectrices in these birds we encounter another of those unexpected correlations which meets the student of avian evolution at every step. As regards colour there is no doubt but that the snow-white *tibetanum* birds are by far the more specialized. White is always an extreme achievement in pigment radiation, or rather elimination, and their coloured young show how recently the adult hue has been acquired. But, on the other hand, the greater number of four-and-twenty tail feathers in the blue-grey *auritum* is in its way as extreme a specialization—excelled in the family Phasianidae only by the adult *Lobiophasis*. Thus the complexity of evolution is for ever being impressed upon us—specialization correlated with generalization and vice versa in closely related organisms. Only by the sum total—the balance after the intricate addition and subtraction of all its character units, and even then only by vizualizing the genealogy in three planes of space—can we ever hope successfully to orient any species in relation to its predecessors and contemporaries.

END OF VOL. I

Alma [illegible]